



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

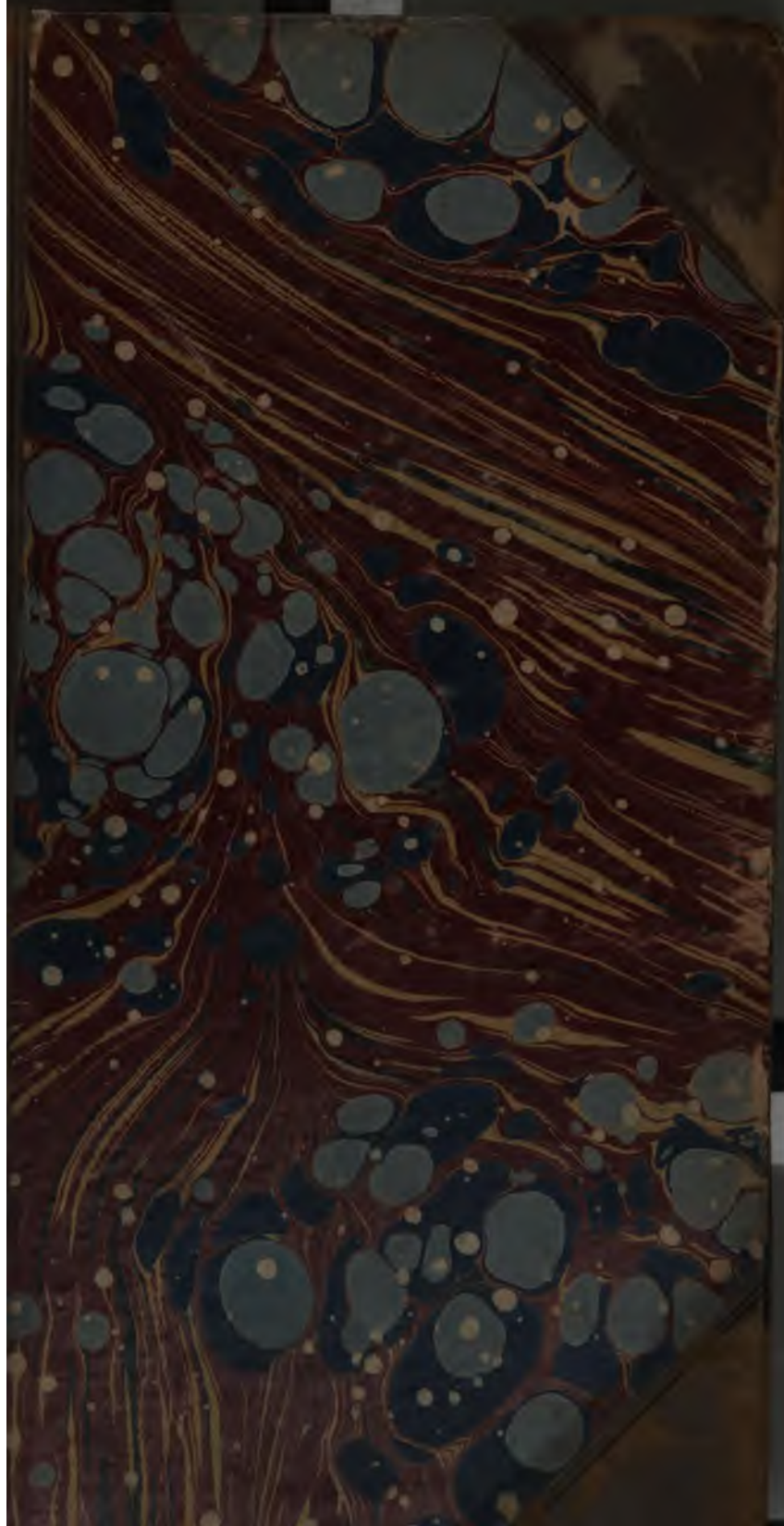
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

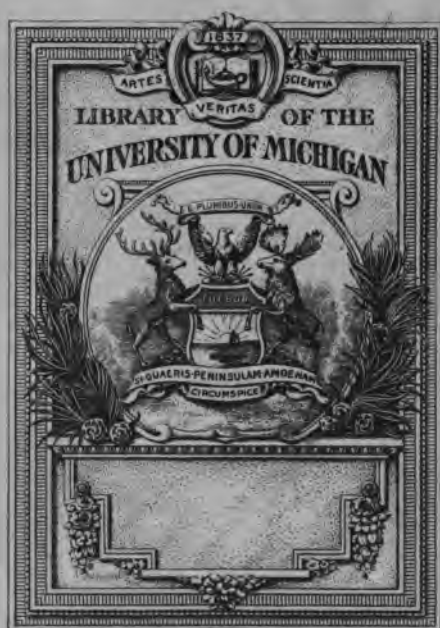
We also ask that you:

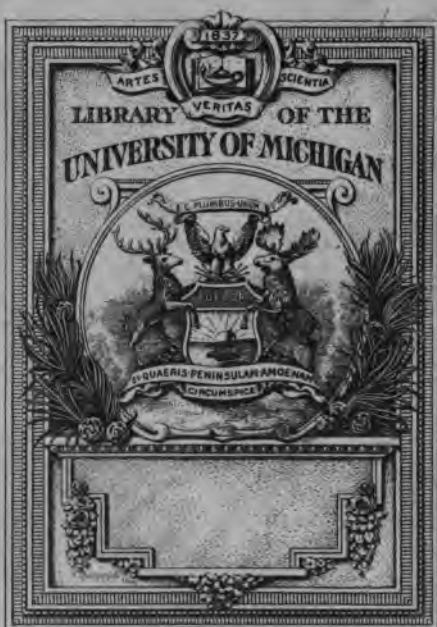
- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>







3
907
296
1897





2.1837

HINTS
ON
AGRICULTURAL SUBJECTS,
AND ON
THE BEST MEANS
OF
IMPROVING THE CONDITION
OF THE
LABOURING CLASSES.

BY *J. C. Curwen* **J. C. CURWEN, ESQ. M.P.**
OF WORKINGTON-HALL, CUMBERLAND.

"Omnium autem rerum è quibus aliquid acquiritur, nihil est Agricultura melius, nihil liberius, nihil dulcius, nihil homine libero dignius."
CICERO,

SECOND EDITION,
IMPROVED AND ENLARGED,

LONDON:
PRINTED FOR J. JOHNSON, ST. PAUL'S CHURCH-YARD,
AND B. CROSBY AND CO. STATIONERS' COURT.

1809,

R. WILKS, Printer, 89, Chancery-lane, London.

101-2



TO
THE RIGHT REVEREND
RICHARD WATSON, D.D. F.R.S.
LORD BISHOP OF LANDAFF.

MY LORD,

AN application having been made by a respectable individual, to collect and republish, at his own risk, my Prize Essays on the Economical Feeding of Horses and Cattle, with the hopes of giving them a more extended circulation, I have not thought myself at liberty to withhold my consent.

Many of the experiments owe their origin to suggestions gleaned in conversations I have had the pleasure and satisfaction of

holding with you, which emboldens me to solicit the honour of your sanction and kind permission of dedicating them to your Lordship.

Nothing can be more gratifying than this public opportunity of acknowledging the many obligations I am under to your Lordship, for the uniform kindness of years, and at the same time professing the profound respect and esteem entertained for your character.

One of the most powerful incentives to the prosecution of my Agricultural exertions has been the encouragement and approbation which you have been pleased to bestow upon them: greatly indeed am I beholden to your Lordship for this inexhaustible source of amusement, which has employed so large a portion of my time pleasurablely, and, as I am willing to suppose, not altogether unprofitably to the community or myself.

In

In common with a large majority of the kingdom, I lament, for the sake of the country, that talents, which on so many various occasions have been so powerfully and successfully employed in defence of religion, in providing for the security of the empire, and in the extension and elucidation of science, have not been called forth to fill the first stations in Church and State.

Your reputation, my Lord, stands on too solid and secure a basis to acquire additional fame or celebrity from the blandishments of rank or power. The acquirement of honour by servility, or the petty intrigues of a court, have something in them repugnant to the feelings of elevated minds, and are incompatible with that independency of character for which your Lordship has been distinguished. Whilst enlightened and liberal sentiments of toleration, calculated to exalt that Church of which you are

so conspicuous a member, and to disarm opposing sects,—whilst unshaken attachment to the principles of our glorious Constitution, as declared at the Revolution,—whilst an enlarged and comprehensive knowledge of the interests of this extended empire, united to a zealous, dignified, and patriotic disposition strenuously to promote its spiritual and temporal prosperity,—can command respect, and warm the hearts of Britons, your Lordship's memory will live revered and beloved.

Those who have the felicity of seeing your Lordship in private life, will bear testimony with me, that however splendid the virtues which adorn your public character, they are equalled by qualities, though less brilliant, not less estimable, which so justly endear your Lordship to all within the sphere of your domestic and social intercourse.

Deign, my Lord Bishop, to accept this
sincere

DEDICATION.

ix

sincere and unfeigned tribute of respect,
and permit me the honour of subscribing
myself,

MY LORD,

Your Lordship's

Most obliged

and faithful humble Servant,

J. C. CURWEN.

Workington Hall,

Jan. 1, 1808.



PREFACE.

A MORE rapid revolution of public opinion has seldom taken place, than has been observed in Great Britain within these few last years, in the increased estimation and importance attached to Agriculture.—But a short period since, it was received by the greater proportion of the community as a mere mechanical operation, requiring scarcely more intellect to direct than to perform, and in which he who guided the plough was reduced nearly on a level with his beast. Nor were the political axioms adopted at the commencement of this reign favourable to the interests of Agriculture, or calculated to raise it in the opinion of the country. The fashionable political doctrine of the day asserted it to be more advantageous for Great Britain to import grain than to grow it. The changes made in the system of the Corn Laws in 1766, founded on these opinions, operated to the depressing of Agriculture, and to the aggrandizement of Commerce. From that moment the export of grain

grain almost entirely ceased, and we became ourselves importers, with a deficit increasing annually, and that to a most alarming degree.

To what extent our dependence on foreign countries might have proceeded, it is difficult to determine; in proportion as our demand for grain annually increased, so did the export of our manufactures, and with them the number of unproductive hands. Thus our national prosperity had the appearance of being in a most flourishing state of advancement. The years of scarcity, however, taught us a very important truth, (one which we unhappily purchased with much misery, and which the predilection for commerce had induced the nation entirely to overlook)—that whilst we were manufacturers for all the world, we were in the utmost danger of being starved at home for want of bread. The wise measures adopted by Parliament in consequence of the sufferings of the country, together with other causes, have excited a spirit of improvement that bids fair not only to produce a supply of grain equal to our present wants, but to provide likewise for a great increase of population.

I should



I should contend, that in every well-regulated state, Agriculture ought to form the basis of its greatness, and Commerce merely the superstructure; and that the first and principal object of consideration should be, to provide victual necessary for the maintenance of the whole community: this accomplished, whatever portion of the population remained without employment, would fairly measure the extent to which manufactures could be carried on with safety and advantage.

A sufficiency of food being once secured for the present population, a surplus of the necessaries of life would ere long accrue; and thence a spirit of external trade and commercial enterprise be excited with the best-founded expectations of permanent advantage.


It appears consonant to the wisdom of Providence, that the productions of the earth should be greatly diversified, as a motive and stimulus of human exertion; and that, in the commonwealth of kingdoms, the most distant nations should be reciprocally dependent upon each other for what is necessary, convenient, or useful to the greater enjoyment of human existence; and doubtless

less this inherent principle of action cannot be suspended by the violent and arbitrary measures of a successful despot. He may indeed succeed for a moment in interrupting and suspending commercial intercourse; but he cannot long resist the impulse of general feeling and the common sense and reason of mankind.

In the present awful crisis of public affairs, which threatens to prove ruinous to numbers, and yet which may not be ultimately injurious to the general prosperity of the empire,—should the partial suspension of trade throw a part of the manufacturing population and capital into the employment of Agriculture, and thereby accelerate the internal improvement of the country,—the security of the empire would be promoted, and its real strength and power increased.

In tracing the progress of agriculture, an art practised from the earliest times, the mind is forcibly struck by the slow advances it has made, and the state of mediocrity in which even at this day it remains in the greatest part of civilized Europe.

The occupation of husbandry appears above all others congenial to the character
of



of man, suited to those sentiments of independence so natural to him, till subdued by force, or abandoned from corruption. The history of nations seems to prove the very reverse, and exhibits agriculture as not rising in estimation until arts, commerce, and sciences have advanced towards maturity.

That agriculture above two hundred years ago engaged the attention of men of the first genius and influence in this kingdom, we have a proof in the works of Lord Bacon, who strongly recommends the value and importance of irrigation. In 1653, W. BLITH published his Survey of Improved Husbandry, in which is contained much useful knowledge. In truth little has been since added.

Jethro Tull's admirable work on drill-husbandry, which has proved of such great utility to the nation, appeared a little too early to procure for its author all the credit to which he was entitled. In how small a part of the kingdom, even at this day, is the drill-husbandry established?

The moment is not yet arrived, though not distant, when the empire at large will concur in recognizing Agriculture as the real foundation of its strength as well as the first ingredient

ingredient in promoting the happiness of its inhabitants. In the course of the last forty years these opinions have been gradually gaining ground with all ranks: in the last ten years their progress has been most rapid.

The general spirit with which agricultural improvements have been embraced in various parts of the empire, has had the happy effect of advancing our national prosperity beyond all former periods, notwithstanding the unexampled pressure of war and taxation.

In the course of the last forty years, many patriotic individuals have exerted themselves to rouse the attention of the landed proprietors, and of the country at large, to the importance of agriculture; and their labours have not been unsuccessful in representing it as a pursuit worthy of the application of gentlemen, affording a rational and pleasurable source of amusement, and combining, in a high degree, individual profit with public advantage.

Amongst the first books of modern husbandry may be reckoned Lord Kaimes' "Gentleman Farmer." That great and good man, to whose friendship I owed so many personal obligations, did not content himself

himself with mere theoretical opinions, but set a noble example of improvement on his estates at Blair-Drummond ; and to him we are indebted for the first suggestions of the establishment of a Board of Agriculture. About the same period, the successful exertions of a single individual (Mr. Bakewell) called forth the public attention by his intelligent and indefatigable experiments in the improvement of stock.

To the Bishop of Landaff the nation owes its first acquaintance with the importance of Chemistry, as connected with Agriculture ; and from his ingenious labours we are now reaping the advantage of many valuable and important discoveries.

Natural History, Botany, and Mechanics, have respectively contributed to promote, extend, and facilitate the various objects of Agricultural industry ; while on the other hand, the researches of the learned, and particularly of the Author of the “ Husbandry of the Antients,” have stamped upon it the character of distinguished approbation, and traced it down to us from periods of the highest and most virtuous antiquity. And thus from a combination of causes may be deduced this solid truth, that the best informed and

greatest men cannot better secure their glory and happiness, than by encouraging a pursuit, as productive of pleasure and profit, as of true independence and feelings of national attachment.

The memory of the late Duke of Bedford must be ever dear to the country, from the zeal and ability with which he espoused the interests of Agriculture. It was reserved for this manly and patriotic character, aided by Mr. Coke, of Holkham, and other public-spirited individuals, to draw forth the intelligent farmer from his relative obscurity, and place him in that respectable point of view, to which that meritorious and spirited class of individuals are so justly entitled. By the example of such men the country has been induced to regard with favour, and reward with approbation, the exertions of those engaged in the labours of Agriculture.

To the Board of Agriculture, and to its indefatigable President, Sir John Sinclair, the country is largely indebted. Nor is there any incorporated body, from whose exertions the nation has derived more real benefits than from those of the Society for the Encouragement of Arts, Manufactures,
and

and Commerce, who have been the patrons of many valuable discoveries, and at all times the strenuous promoters of Agriculture.

Conceiving this moment particularly important for the interests of this branch of national industry, and that a new era in our system of internal and external politics is likely to arise, I have been the more willingly induced to give my consent to the collection, in one single volume, of my detached hints on the Economy of Feeding Stock; not without sanguine hopes, that the fruits of some practice and experience may contribute in a small degree to the furthering of those objects which are ultimately connected with the prosperity of every individual.

I feel still more inclined to accede, from the belief which I entertain, that rapid as the improvements in Agriculture have been (especially within the few last years), there is not yet drawn from the earth a fifth part of the produce that might be obtained by a more perfect system of Agriculture, by a general inclosure of waste lands, and by a proper economy in the feeding of stock.

Under these powerful convictions, I submit the following pages to the candid perusal of my countrymen ; trusting that, at a moment when the exertions of every class of society are imperiously called for in defence of our country, and in support of its best and most vital interests, the present publication may not be entirely useless ; and that my example may serve to stimulate other more experienced persons, to submit the result of their practice to the consideration and free inquiry of an enlightened and liberal public.

The favorable reception of a former edition of this work, under many disadvantages, has operated together with other circumstances to induce me, not only to undertake the revision, but to make considerable additions, with the hope of correcting not only the errors of the press, but others of my own of more consequence. I trust that the work may now appear in a form and at an expense which may give it a chance of extending its circulation to the practical farmer.

The opportunities since afforded me of visiting a great variety of farms, in different parts

parts of the kingdom, have contributed to strengthen my former opinions, that economy in feeding stock is a lesson yet to be learned by the generality not only of gentlemen-agriculturists but of farmers. I have been highly gratified by learning that my mode of feeding has, in different parts of the kingdom, been tried and approved.

The plan of supplying milk for the labouring classes is, I am happy to say, likely to be extensively adopted.

Important as I have previously assumed agriculture to be to the interests of the empire, the circumstances of the times render it still more imperiously so. The last has been a year of non-importation. Had our wants required it, our circumstances were such as to debar all assistance from our former sources of supply. Does not, then, our safety, the only hopes for restoring the independence of Europe, rest on our agriculture? Who can contemplate the situation in which the nation is placed, and refrain from giving active support to every measure by which the cultivation of the soil can be promoted? Can this be too often or too strenuously impressed on the public?

But

But a few years ago, (since the commencement of the war) a twelfth part of the grain annually consumed was imported. In the two years preceding the last, a twenty-fourth part only was required. In the year preceding the last, though there was a failure in some of the crops, there was a sufficiency of grain of our own growth to answer all demands. The pressure, except in a few particular districts, was not severe. The advance in the prices of grain has not been without benefit, first in promoting cultivation, and farther by affording employment to a part of that population which the stagnation of manufactories had deprived of work.

Those who concur with me in opinion, that it is more than probable that our foreign trade may never attain to its former extent, will be ardent in their wishes that those sources of national wealth, which are independent of foreign control, should be the first objects of national attention. England and Ireland afford ample room for improvement. Who can view without regret the enormous grants of public money annually voted for the support of some of our
foreign

foreign possessions, from which it would be difficult to point out any object obtained beyond an increase of patronage to persons in power. With a part of these sums, so uselessly lavished, what important national purposes might be effected !

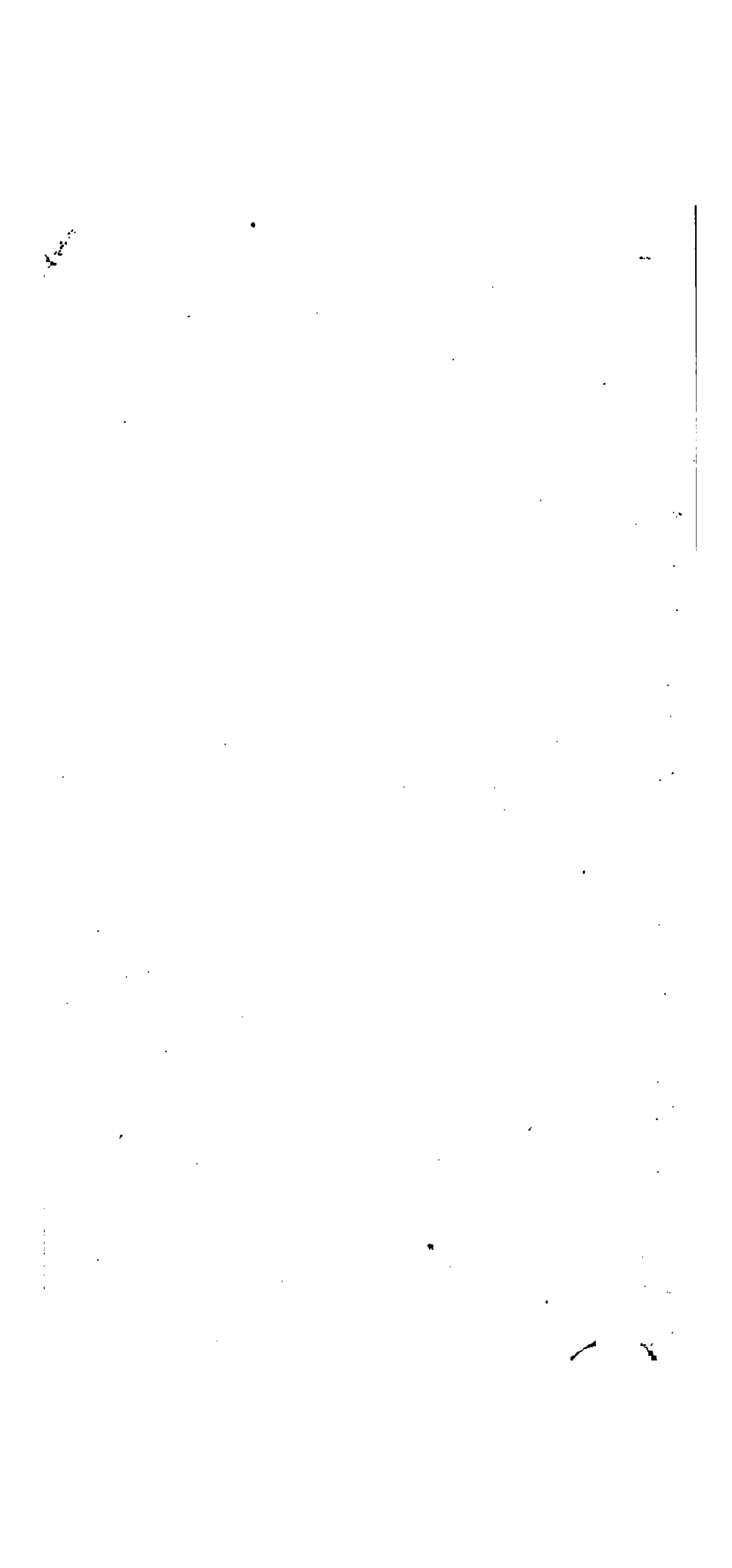
That great and radical reforms are wanting, will scarcely be denied. Though a revenue is raised which places above half a million of people dependent on government, it is no proof of the flourishing state of the empire, that on examination there is found a million and a quarter of Britons existing on parochial relief.

There must be something fundamentally wrong when the efforts of honest labour will not afford the means of supporting a family independently.

From whatever causes have sprung this lamentable situation of affairs, it must be the wish of every friend of his country to see a speedy remedy applied. May we not reasonably hope, by employing a larger part of the mass of the people in the occupations of agriculture, and by early attention to the education of the rising generation, that probity, industry, and frugality may
be

be generally re-established, and a superiority in happiness as well as liberty mark and distinguish the people of these realms above the rest of Europe.

Workington-Hall,
Jan. 1809.



ON THE
STEAMING OF POTATOES,
AS A
SUBSTITUTE FOR HAY,
IN THE
FEEDING OF WORK HORSES.

ON THE

• STEAMING OF POTATOES,

&c. &c. &c.

IN October, 1801, I commenced the experiment of feeding work horses with steamed potatoes. The first attempt was made without any mixture of cut straw ; but finding the horses had some difficulty in masticating the potatoes, an addition of a sixth part of cut straw was made, which not only removed that inconvenience, but was found to answer a further beneficial purpose, by counteracting the too rapid digestion of the food.

This, as with almost every material change from long established custom, was the result of necessity, not of choice. The failure of the hay crop in the northern parts of England and Ireland, occasioned considerable alarm to all persons who were under the necessity of keeping a number of horses.

Hay was sold in July and August, at from 8l. to 10l. per ton ; a further and still more serious cause of anxiety arose from there being every reason to believe, that no considerable supply could be obtained at those or any other prices.

Alarmed by a danger which threatened to affect, so materially, the public interest, as well as my own, my

season above sixty thousand stone of potatoes were steamed. The quantity has annually increased. The report of my large consumption has brought considerable importations from Scotland and Ireland ; and I have been able to purchase them from three halfpence to twopence halfpenny per stone ; and by taking whole cargoes, it has afforded me the means of occasionally selling them to the poor much below the market price.

A strong argument in favour of potatoes, in preference to hay, is the ease and facility with which they can be conveyed, and likewise their being exempt from injury by water carriage. Were I to contract for my supply, I should be a considerable gainer, as the lands near Workington are let from 40s. to 6l. per acre ; in Scotland and Ireland at not 20s. and labour is proportionably cheap.

Combined with the individual saving is that of the public. Thus, a hundred horses, constantly fed on hay, would require two stone per day, or, for each horse, 730 stone per annum ; and supposing a ton and a half per acre, each horse would consume the produce of three acres. Two stone of potatoes, per diem, would, on ground of the best quality, be little above the third of an acre ; the saving would consequently be, *two acres and a half*, on each horse, or 250 upon the number I am obliged to keep.

I was very sanguine in my expectations, of succeeding with wheat after potatoes ; but on wet ground the risk of season is so great, and the failures so frequent, that I have relinquished the system, and take
oats

oats drilled and sown down with clover, and wheat, from the clover root, the succeeding year. The change in my mode of feeding horses has proved very advantageous to the purchasers of hay in this neighbourhood: formerly my wants were the barometer of price, now it seldom exceeds 4l. per ton. Two years ago it was 8l. and 10l. a ton. Strange as it may appear, it is no less matter of fact, that several of my own farmers bought hay for the feeding of their horses, which were employed in the same work as mine that were fed on potatoes, imported from Ireland and Scotland, at 2½d. or 3d. per stone; the purchasers having also to lead four or five miles, and in some instances, even still further; the allowance of oats the same. There was undoubtedly a great difference in point of condition, but this difference was in favour of the horses fed on potatoes.

Six years have now elapsed since I adopted this plan, which must be allowed to have afforded a full and fair opportunity for making a deliberate and dispassionate estimate of its merits.

First, as to the saving of expense: secondly, as to its being a food on which horses can perform their work: thirdly, as it affects the health and condition of the horses. Upon all these points I have no doubt or hesitation in declaring, that the potatoe feed has decidedly the advantage, and I make this assertion with the more satisfaction, as it will be corroborated by every person who has fairly made the experiment.

The objections that are commonly urged against steaming of potatoes, are labour, fuel, and the first

cost of the apparatus. In opposition to these I should state, that the saving between the cost of hay and potatoes (where land is of considerable value) is such as abundantly to compensate the expenses attending steaming; and the superior condition and health of the horse is a further argument in its favour. As a proof sufficient to establish these facts, I should instance, that it requires from five to six hours for a horse to masticate a stone of hay, whilst he will eat a stone of potatoes in twenty minutes, or less. The saving of four hours for rest is alone sufficient to produce the most essential difference in the health and condition of the animal: after great fatigue also, a horse would be tempted to take warm food, when he would not eat hay. As a proof of the excellence of this food, I have at this time in my works, horses which were six years ago purchased of a farmer, who was selling off his stock, as worn out, and of little value, and which are yet able to do their work with the best horses I have. I think there is little doubt of the life of this valuable animal being considerably prolonged by this mode of feeding. I have met with but one instance where there was any difficulty in getting them to eat the potatoes*.

The cost of hay, at the cheapest rate, is double that of potatoes, but more frequently three or four times as much. The loss by steaming is an eightieth part, that of roasting, a sixth, without admitting of the

* The potatoe top, or haulm, when properly dried, makes very good litter for cattle. I have found it of very great service.

benefits which result from the mixture with straw*. In the present season (1807), when the crop has failed, I have begun to mix an equal quantity of cut straw and potatoes: to the horses that are below ground, in the coal-works, and obliged to remain there, I am under the necessity of allowing a proportion of hay, as well as potatoes: formerly it was 14 lb.; I have now reduced it to 9 lb. of hay, and 5 lb. of straw, and shall very shortly make the quantities equal. Racks are, according to this mode of feeding, as unnecessary as they are productive of waste, for to save trouble, they are always filled; and what is not eaten is so tainted with the breath of the animal as to be wasted.

Work horses of size consume little if any thing short of two stone of hay in 24 hours; (working oxen are stated by Mr. A. Young, from an experiment made by the late Duke of Bedford,) to eat two stone and a half in the same period. To this consumption must be added the unavoidable waste so long as the practice of feeding from racks continues. I

* Doubts have indeed been entertained of the correctness of this statement of the loss sustained by steaming. From recent experiments upon eighty pounds at a time, I have found the best and most farinaceous potatoe rather to gain than lose. I am not enabled from experience to judge of the comparative excellence of roasted and steamed potatoes. Assuming bulk to be as requisite as nutrition, the loss in weight must decide the question in favouring of steaming. It would be impracticable to roast two tons per day, which is my daily consumption: the surface of a square yard containing only four stone eight pounds weight of potatoes.

have

have found the saving very great by cutting hay and straw, which I do both when they are given mixed and separate. I was highly pleased to find after a very little practice, that the horses preferred the cut food to what was given uncut in the racks. When both were presented to them, they took what was cut.

Having destroyed all old lays, I have no other hay than clover : this I propose mixing and stacking with alternate layers of clover and straw, in nearly equal proportions.

An ounce of animal food is supposed, by Dr. Pringle, to possess twelve times as much nourishment as the same quantity of vegetable food, and yet two ounces of meat would not support nature, whilst twenty-four ounces of bread might do it : Bulk appears as requisite as nourishment ; to ascertain in what proportions they are to each other is object of great importance in the feeding of animals. I question whether the cutting of hay and straw will not also be found highly beneficial, by facilitating the horse's getting his fill. A very striking instance of the superiority of the potatoe feed occurred in the last year ; twenty horses were sent to an adjoining farm, where there was no convenience for steaming ; these horses had hay in lieu of potatoes, the same quantity of oats, and the same hours of work ; notwithstanding all the care that could be taken of them, they lost their condition, and were not to be compared to the rest of my horses.

In Scotland I understand salt is given with the potatoes. I have no doubt it may be found beneficial ;
but

but the difficulty of preventing frauds, as well as the increase of expense, has deterred me from trying it.

The allowance of oats to colliery horses is 12 lb. per diem; farm horses, 8 lb.; horses employed in drawing very heavy weights, 10 lb.

For three years I have made use of carrots, giving 5 lb. to each horse, and taking off 4 lb. of oats, which keeps them in great health and spirits; as much, or more so, than with the full allowance of oats.

ESTIMATE OF FEEDING A FARM HORSE PER DAY.

1½ stone of potatoes at 3d. per stone,	£	s.	d.
which exceeds an average price,	0	0	4½
7 lb. of cut straw 1 d., labour 1d.	0	0	2
Steaming,	0	0	0½
7 lb. of straw,	0	0	1
8 lb. of oats, estimating the cost at 3s. 6d.			
per Winchester weight, from 40 to			
44 lb.	0	0	8
	<hr/>		
	0	1	4

COLLIERY HORSE.

1 stone of potatoes,	0	0	3
Steaming,	0	0	0½
9 lb. of hay, at 6d. per stone, and cutting ¼d.	0	0	4½
7 lb. of straw,	0	0	1
12 lb. of oats,	0	1	0
	<hr/>		
	0	1	8½
	Horses		

Horses carrying great burdens are allowed but 10 lb. of oats.

One labourer is sufficient to steam and wash 180 stone per day.—Three Win-

chesters of 61 lb. weight, of coals, cost £ s. d.

laid down at the house, 0 0 10½

Labourer's wages, 0 1 8

Cost of steaming, at ¼d. per stone,

0 2 6½

0 3 9

This leaves a surplus of

0 1 2½

In seven months' steaming, this will amount to 13l. 12s. 7d. which will be sufficient to keep the apparatus in order.

An average crop of potatoes may be estimated at 1400 stone, which, at 3d. amounts to 17l. 10s. On good ground, 2000 stone may reasonably be expected, at 25l. per acre*.

The cost of managing an acre of potatoes, in a complete manner, is 15l.; but this mode of culture is nearly equal to a fallow, and puts the ground in high condition for succeeding crops.

* The red Bullock Potatoe answers equally well for steaming; and generally speaking, the produce is one-half more than that of the white kidney. I had this year on double rows, eight inches apart, and five feet between the stitches, 2660 stone per acre. This method of planting potatoes answers extremely well, uniting hand and horse-hoeing.

COST

COST OF APPARATUS AND STEAMING-HOUSE.

	£	s.	d.
Potatoe washer	12	12	0
Four tubs, at 2l. 2s. each,	8	8	0
Boiler and grate,	5	5	0
Platform for the tubs,	10	10	0
Pumps	5	5	0
Building	60	0	0
	£ 102	0	0

The increase of wages, and advance in materials, may enhance the expense from 10l. to 20l. beyond what it was estimated at five years ago.

In corroboration of what I have stated, I shall subjoin the accounts I have received from various persons, who have adopted the feeding with steamed potatoes*.

* I have found the washing clothes by steam, in the same mode as potatoes, to answer extremely well, and to be attended with a great saving of labour. The clothes are steeped in cold water for 12 hours; then rubbed with a preparation of soap and soda, or pearl ashes; a pound of soap and a quarter of a pound of soda, to a stone of clothes. All that is requisite, is to have a tub of plane-tree, or fir without any iron. They require steaming for about an hour, and are afterwards washed out in cold water, taking care to change it frequently. Farmers will find this well worthy their attention.

Observations,

Observations, by the Bishop of Landaff, on Mr. CURWEN'S Method of Steaming.*

I AM now with Mr. Curwen, at Workington, and have seen his manner of steaming potatoes, and applying them as a substitute for hay in the feeding of horses. I understand that he has transmitted to the Board of Agriculture an account of the process, and that he is a candidate for a medal. The committee must be sensible that potatoes have been used, not only as a substitute for hay, but for corn; and with cut straw, both for hay and corn. Notwithstanding this, Mr. Curwen's experiments are, in my opinion, greatly deserving the attention of our society; they are carried on with great accuracy, and on the most extensive plan; and I can bear witness to the excellency of the machinery with which the process is conducted, and a saving of labour will be made by Mr. Curwen, in a new machine he is about to erect, by the substitution of a wheel, to be moved by a rill of water, in turning the washer. I thought Mr. Curwen entitled to this testimony, which may be mentioned to the committee, but as too unimportant for the consideration of the Board.

* Communications of the Board of Agriculture, vol. IV.

Additional Communications on Steaming.*

TO THE RIGHT HON. LORD SHEFFIELD.

MY LORD,

CONCEIVING it may not be unacceptable to your Lordship, to be made acquainted with the progress that feeding of horses upon steamed potatoes and cut straw, as a substitute for hay, is making in Scotland, I take the liberty of inclosing you a letter upon the subject. I have now had some years' experience, and am more than ever confirmed in my opinions of its efficacy, and the saving both to the individual and the public. I sent a person, a few month since, to R. S. Dansie, Esq. of Clater Park, Herefordshire, to erect an apparatus, and to put them in the method of conducting the feeding; and have the satisfaction to find it answers extremely well, indeed it cannot fail, if fairly tried. I wish his Grace the Duke of Bedford could be prevailed upon to make the experiment; The extensive scale of his Grace's feeding would make it an object of consequence, and call the public attention to it. The soil near Woburn would answer very well for the growth of potatoes.

Extending the culture of potatoes is an object of great national importance, as leading to an increased growth of bread corn. Potatoes are sold in the markets of this county from $2\frac{1}{2}$ to 3d. per stone, but may be imported from Scotland, free of all charges, at $1\frac{1}{2}$ d.; hay is selling from 8d. to 10d.; since Octo-

* Communications, &c. vol. V. p. 210.

ber, I have steamed 300 daily ; allowing that quantity to be equal to half the number of stones of hay, the saving will be, at 7d. per stone, 1l. 17s. per day.

I beg your Lordship's pardon, for occupying so much of your valuable time.

I have the honour to be, &c.

J. C. CURWEN.

WORKINGTON HALL, Jan. 26th, 1806.

*Copy of a LETTER to JOHN GRIEVE, Esq.
Edinburgh.*

Charlestown, Oct. 31st, 1805.

DEAR SIR,

I SHOULD have written you last night, but was prevented by the fatigue of my ride. I did not forget your boiler, but was informed by Mr. Stainton, that they had not any ready-made boilers of any kind.

In feeding their horses, the Carron Company proceed upon Mr. Curwen's plan. They have three tubs steaming at a time, two of potatoes, and one of chopped straw, chaff, or dusting seeds ; they empty one tub of potatoes into a large mash tub, by way of bottom layer, then the tub of chopped straw, and last, the remaining tub of potatoes, and the whole is wrought and mixed up with a large wooden pestle ; to this they add a small quantity of salt : a bucket is brought to each horse, with his feed of corn (bruised between rollers) in the bottom, and his proportion
of

of potatoes is filled in above. When it is emptied into the manger, the corn is, of course, uppermost, and the horse feeder puts his hand through the feed to mix it.

The proportions they give to their large horses in the work are, at mid-day, 7lb. of potatoes (raw weight) to each horse, and one pound of cut straw, mixed with his usual quantity of corn. In the evening, fourteen pounds of potatoes, and the same quantity of straw mixed with his corn, or they mix the straw in the proportion of the potatoes. They cook twice a day, and give the feed warm. At their collieries, where their horses are smaller, they give six pounds at mid-day, and twelve at night.

The Carron Company bought their potatoes this year at 6d. per boll, and I have to-day bought 200 at the same price. I understand the scheme is adopted at the Kinnaird Colliery at Alloa and Halbeath, and Mr. Beaumont and I follow these examples. I find, by experiment, that a boll weighs 22 stone avoirdupoise.

I am, &c.


W. WOTHERSHOON.

By a Scotch newspaper, I observe his Grace the Duke of Bedford had viewed the coal-works at Halbeath, a few weeks ago, and amongst other objects had noticed the steaming apparatus for preparing potatoes. I trust the having seen it, and heard the report of its success, may induce his Grace to be the introducer of it into Bedfordshire. The Rev. St. John

Priest attended the Agricultural Meeting at Workington this year, for the express purpose of witnessing the process, and learning, on the spot, how far it had answered, in order to recommend its adoption into Norfolk. Mr. St. John Priest made various experiments also on the draught of Scotch (Carron) carts. If this able and intelligent Secretary of the Norfolk Agricultural Society can succeed in establishing the potatoe plan of feeding, and can convince the Norfolk farmer of the advantage he would derive from using single horse carts instead of waggons, he will render to that county a most essential service, and save the labour of every fifth horse, upon the most moderate calculation.

I have at this time four steaming houses; one at the Schoose, a second in the Stable yard, a third at Moore Close, and a fourth at Ewanrigg. In no instance has it failed, where fairly tried. An experiment was made by a neighbour of mine; who reported to me, after some time, that it had not answered: on enquiry, I found that the potatoes were given as a substitute for corn, not hay. Every undertaking so conducted can have but one fate.

Economy in the feeding of horses is an object of importance, both as it concerns the individual and the public. When it is considered, that six millions of the best acres in the kingdom are applied for their support, every contrivance which is calculated to reduce the number, or to feed them with a less proportion of ground, is deserving of serious attention; and viewing it in this light, I could not withhold my assent to the republishing of this essay, with a view to
its



its more general circulation. The circumstances of the country, as well as the discussions which have of late engaged the attention of the public, upon the means of supporting, not only our present population, but an increase of it, will, I trust, not only excuse, but justify, my compliance. I have great pleasure in laying before the public the communications I have received from my friend Mr. Spedding, and also from Mr. Dansie, who assured me, that was he now to propose relinquishing the feeding his horses with potatoes, there would be as much opposition to his so doing, as he met with when he first commenced it.

I have reason to believe potatoe feeding is practised to a considerable extent in Liverpool.

I have had occasion to notice the extraordinary advance which had taken place during the month of November, in the price of potatoes. This obliged me, from a due regard to the interests of the labouring community, to discontinue my steaming, and to offer the potatoes to sale, which produced the effect expected. By this means I succeeded in reducing the price of this useful, and in this part of the kingdom absolute necessary of life, to sixpence per stone: a price greater than it could be wished they should be at; but below which it might not be prudent to attempt to reduce them in such a season, lest in affording a temporary benefit a lasting injury should be done; by discouraging the very general growth of potatoes.

In the stead of potatoes, four pounds of oats was added *per diem* to each horse, with six pounds of car-

rots and steamed straw. This feeding did not answer, and the horses daily lost their condition, and were reduced to a state I had never before had my horses in. Fortunately I was enabled a month ago to purchase a large quantity of black potatoes from the north of Ireland, which though considered inferior for the table, answer extremely well for steaming. The great and manifest change which has taken place since the potatoes were restored to the horses, has done more to convince my own servants, and the individuals here, of the advantage of this mode of feeding, than all that has passed under their observation for the last six years. The proof arising from circumstances quite unforeseen, of the excellence of potatoe feeding, carries such conviction, that I was unwilling it should not be added to the ample testimony previously given on the subject.

Workington Hall, February 22, 1803.

WE whose names are hereunto subscribed, being in the employ of Mr. Cürwen, and in the daily habit of seeing and attending to his work horses; hereby certify, that the amendment and improvement in their condition (without any diminution of work, and notwithstanding the uncommon wetness and severity of the weather) within the last few weeks, since they have had their potatoe feeding restored to them, is most striking, surpassing what we could have believed or credited, if we had not been eye-witnesses of the fact.

We

We are free to own, although the majority of us have been in the habit of attending the horses fed with potatoes for years, we were not so fully sensible as we now are, from the experience of seeing the potatoes taken from the horses and again restored to them, of the excellence of the feeding, and how especially the potatoes contribute to the health and condition of the horses.

WILLIAM HOODLESS, Land Agent.

ISAAC KENDALL, Bailiff.

THOS. MOORE, Groom.

JOHN DICKINSON, Farrier.

JOS. DICKINSON,

THOMAS COTTIER, } Horse Keepers.

DAVID JACKSON, }

GEORGE ACTKIN, Bailiff, Moor Close.

BORRIS EDKIN.

GEORGE COOKSON.

DARCEY CORVEN.

EDWD. CHAPELHOW.

Mire House, Nov. 3d, 1807.

MY DEAR SIR,

I AM sorry I cannot comply with your desire, to state the result of my last winter trial of steamed potatoes as a food for horses, with all the accuracy I could wish ; for as I resorted to it from necessity, and not for the sake of the experiment merely, I did not pay that exact attention to the quantities used which I might have done. This much, however, I can safely state, that it enabled me to maintain a quantity of

stock, which, from the failure of my hay crop, and deficiency of other fodder, I could not by any other means have effected. I had nine horses, and to maintain them, four acres of potatoes, one of carrots, and two of pease, cut in the bloom, but a weak crop, grown on poor worn-out land. From the potatoes I supplied my family, the consumption of which I computed at 80 bushels, and fattened 10 swine, which devoured me 180; these being somewhat more than the produce of one acre, there were left only three for my horse consumption. A ton of hay was consumed in occasional feeds to a saddle horse and two colts, in a distant shed, when the weather did not permit the potatoes being carried to them; but as one-third of the pease straw remained at the end of the winter, I did not take this into account, but considered my nine horses to have been daily supported on the six acres above stated. The pease straw was cut to mix with the potatoes. As these horses fed on hay would not have consumed less than 25 tons (a good crop for thirteen acres), the advantage of the mode is so decisive in my mind, that I have resolved to continue it as the regular practice of my farm. The expense to me is trifling; one woman executed the whole, besides attending entirely on 23 head of cattle, (pulling and leading the turnips they consumed); and my local situation giving me the advantage of refuse wood, which would otherwise be of small value, even fuel is an inconsiderable object. The condition of the horses were unexceptionable, they were only too fat, though the work they performed was very heavy; four of them

them (regular cart horses); with the assistance of two colts in ploughing the fallows, did the whole tillage of 70 acres, and for different crops led me 2400 bushels of lime and 150 of coal from a distance of 14 miles, besides doing all the extra work which a family in the country must require. I allowed each horse above 9lb. of oats per day, but I think a great saving might be made in the article of potatoes, with advantage, and I intend to try it, by substituting a large proportion of straw. I neither weighed or measured the green crops, but both potatoes and carrots were very fair, though the latter, being drilled at 30 inches, could not be very heavy by the acre.

I am, dear Sir,

Your very faithful Servant,

JOHN SPEDDING.

To JOHN CHRISTIAN CURWEN, Esq. M. P.

Cleator Park, Nov. 10th, 1807.

DEAR SIR,

I RETURN you many thanks for the favour of your letter, as also for the civilities you showed me when at Workington, where I much wished to have stayed longer had the weather proved fair. I think the weight mentioned in your letter must have been of your turnips, although mentioned at the top as potatoe produce. My potatoes were as follows: Early Manchester, on ten yards square, 7 bushels of our customary measure, each bushel weighing

c 4

112lb.;

112lb.; Blue potatoes, 5 bushels 3 pecks; London White, 4 bushels 3 pecks; the stitches were only three feet a part; as the summer proved so very dry, might be in their favour. I have five large pigs, (which, when fat, are expected to weigh 360lb. each) on steamed potatoes only; this food will be continued till near half fat, then some pease or bean flower will be added; they now eat 350lb. in 24 hours. I have three breeding sows, one boar, and several small pigs, supported with the same food. My six cart horses have each 30lb. a-day of steamed potatoes and cut-straw, with the addition of five pounds of carrots to each horse; they have only one bushel of oats or beans bruised, and one bushel of bran allowed per the week, and I think of withdrawing the bran, now they have carrots. I had 270lb. of this vegetable on ten yards square, and one hundred weight of tops; the summer being so very dry, proved very unfavourable to vegetable crops; my carrots had many vacant places, otherwise they would have been a much heavier crop to the prospect.

Your obedient servant,

R. S. DANSIE.

The following interesting Communication was sent me, some time ago, from a very intelligent OFFICER, who had served long in India.

DURING the last seven years of my residence in India, I served with a corps of native cavalry, and had frequent

frequent opportunities of observing the mode usually adopted by the natives of Hindoostan in their management of that useful and beautiful animal, the Horse, as respects his food and shoeing; in this latter part, viz. shoeing, the practice for many ages, both as to the shoe and nail, is that recommended by Professor Coleman, in his late elegant and useful work on that subject. Horses are never used in agriculture, and those used in the cavalry, or for pleasure, are constantly housed, and with a double collar and hind picquet. Their food is either a large species of pulse, called, in Hindoostan, Channa, which is bruised and steeped for a few hours; or a smaller kind of pulse, called Colli; this is boiled, reduced to a paste, and given in balls; there is also a third mode sometimes practised, which is equal parts of channa and barley, ground to a coarse flower, and given in balls; the quantity from ten to twelve pounds weight, in the twenty-four hours, with from twenty-five to thirty pounds of hay. It is to be observed, the horses of Hindoostan are generally under the size of the English saddle horse; the standard for the cavalry of the East India Company being fourteen and a half hands, and there is often considerable difficulty in procuring a sufficient number at that standard.

I have always been an advocate for cutting hay and straw, and bruising corn, for cattle of every description, and am convinced, that any man who has paid attention to the subject will soon see the advantage that must result from the adoption of that practice.

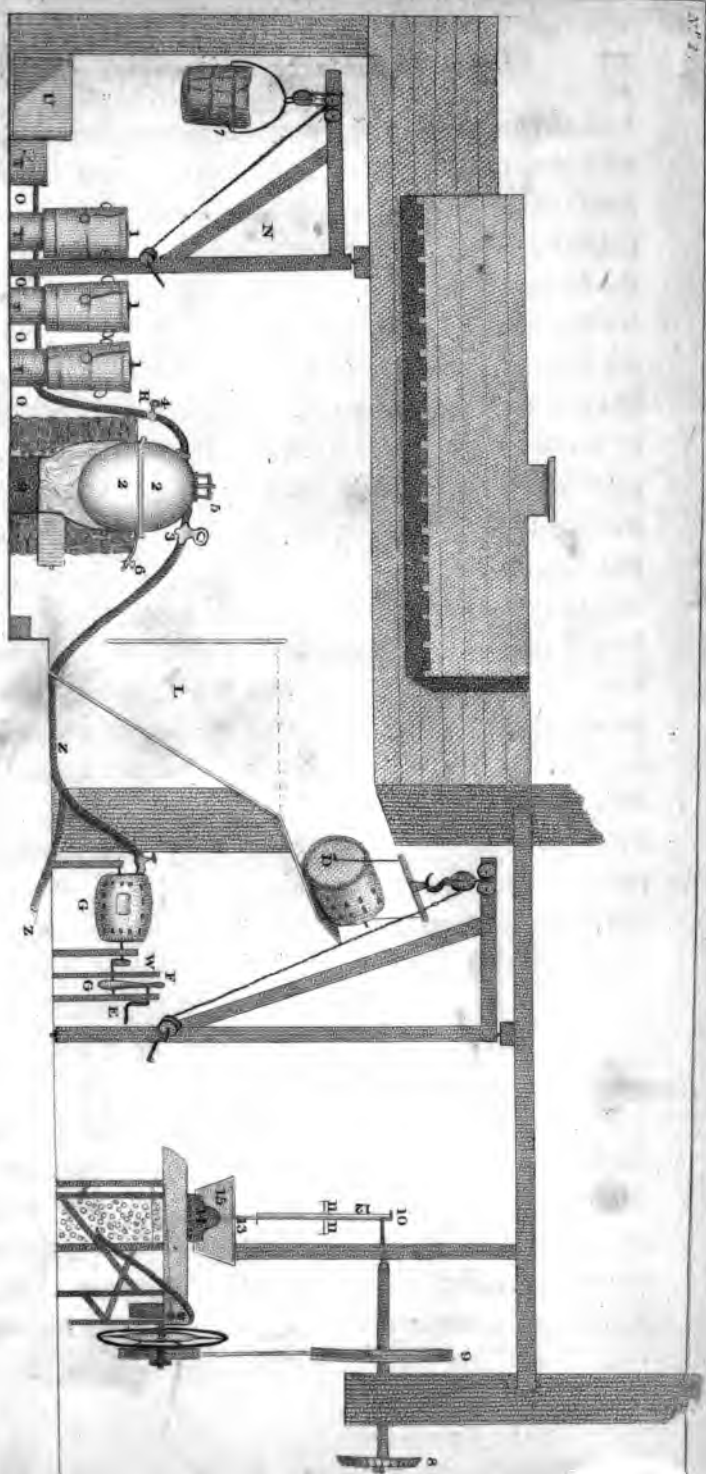
My attention was particularly called to this subject
by

by a circumstance which came under my notice when with the cavalry under Lord Lake, on the western banks of the Junna, 1804. Channa, the usual food for the cavalry, being scantily supplied, Lord Lake ordered the horses to be fed with equal parts of channa and barley, bruised and steeped in the usual way, but from the irregularity of the size of the barley and channa, and inattention on the part of those whose duty it was to see it prepared, the greater part of the barley was given entire, and passed through the stomach and intestines of the horses, apparently little, if at all, impaired in its nutritive quality.

The general scarcity of grain which prevailed at that time induced many thousands to flock to the British camp in search of food, and I daily witnessed, for weeks together, many hundreds of all ages and sexes coming into the lines of our cavalry, and anxiously collecting and carrying away the excrement as it fell from the horse; this they exposed for a few hours to the sun, and by rubbing and sifting it, procured a large supply of good food.

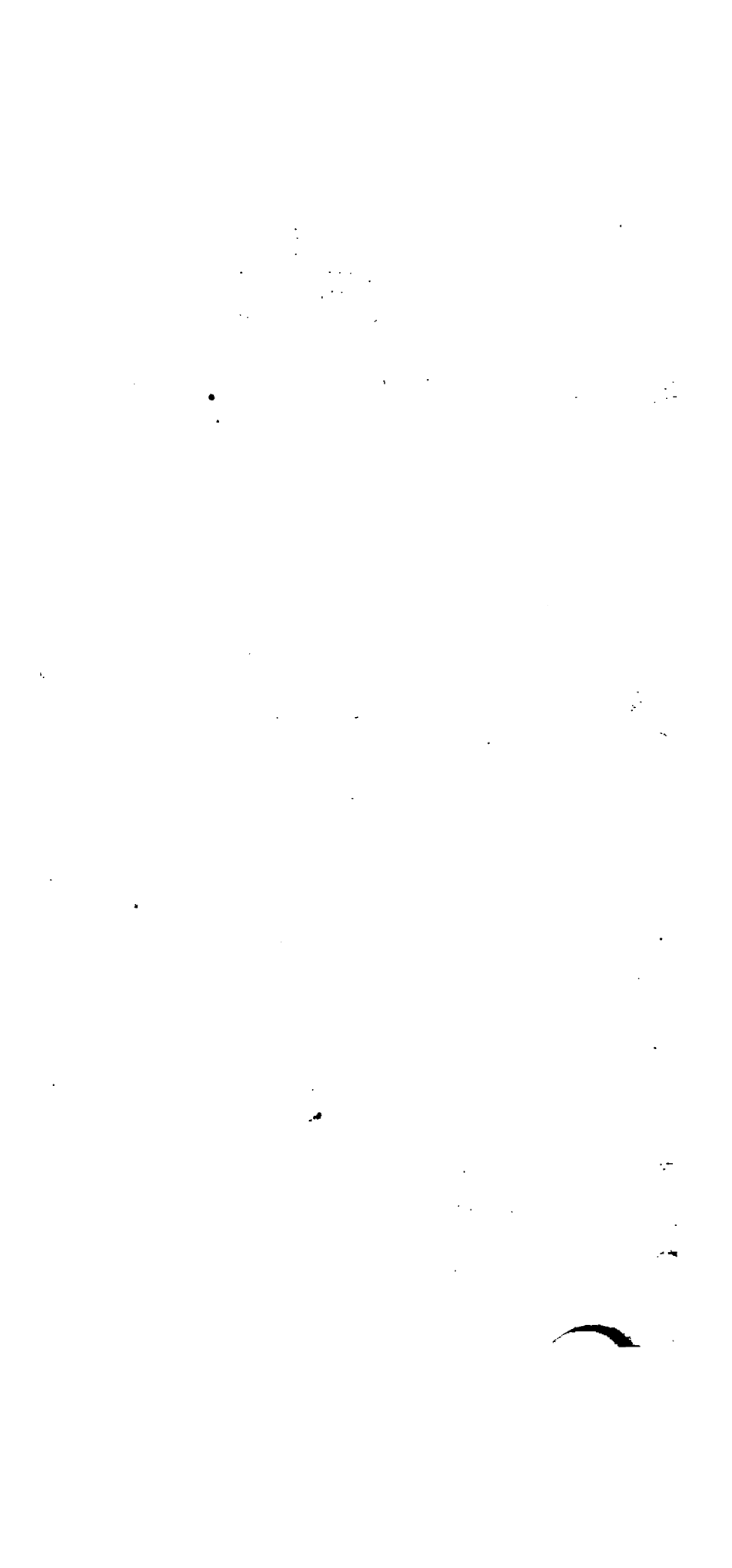
Process of Steaming.

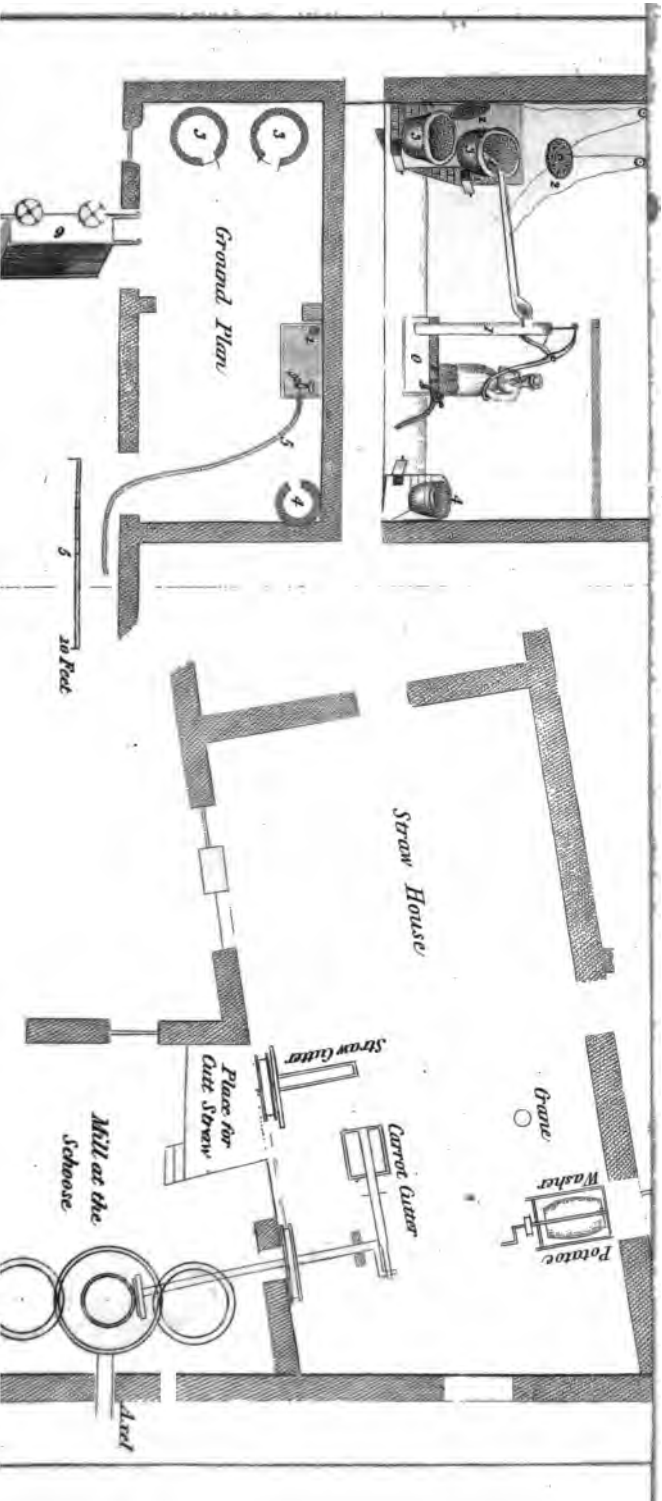
THE washer being removed by the crane, to the place where the dirty potatoes are laid, is filled two-thirds (about 16 stone), and then is set into its box, and turned slowly round, the potatoes cleaning themselves by rolling down the inclined plane, which is formed by turning the washer; five minutes are more than
than

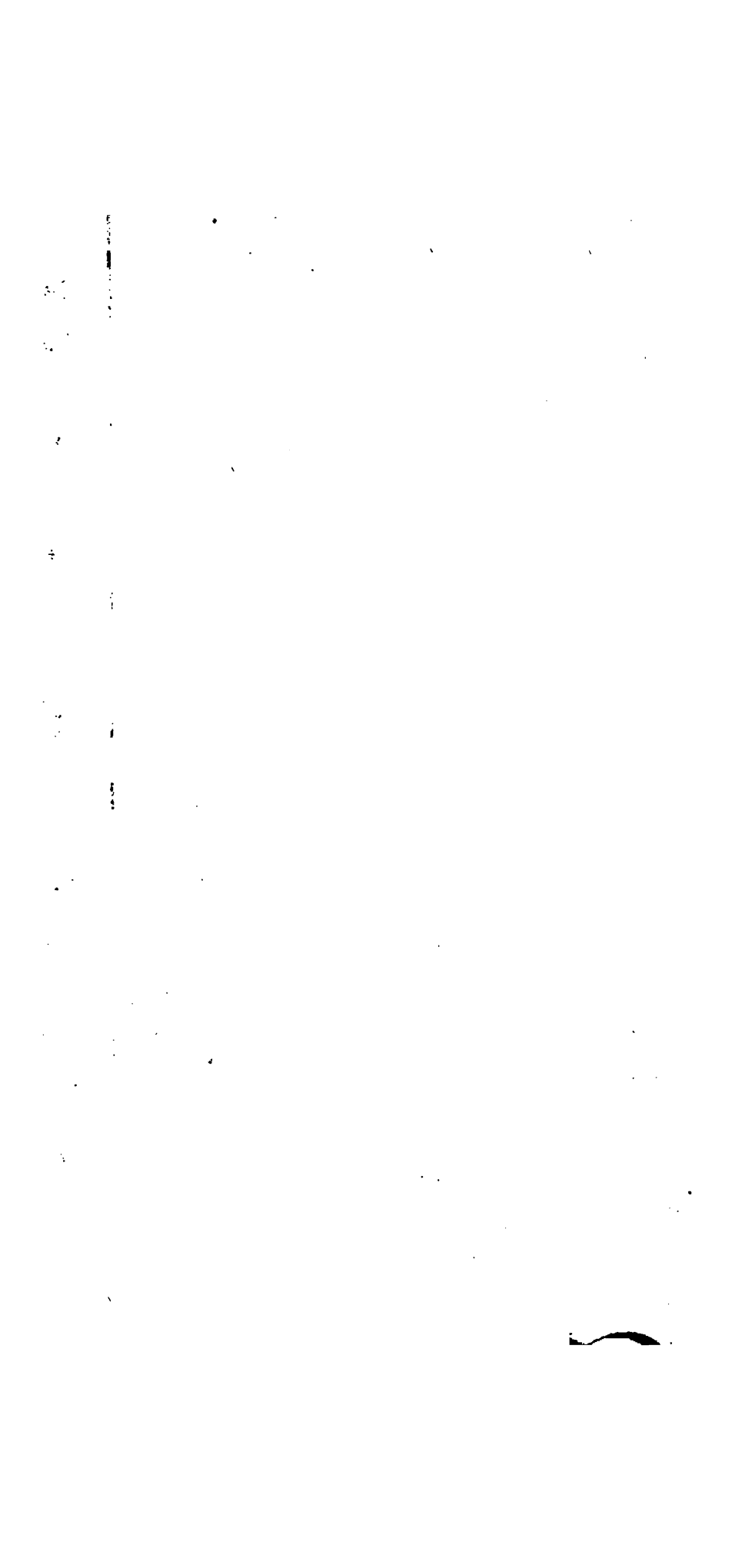


MILL

THE POTATOE STEAMER.







than sufficient to clean them completely ; when lifted from the box, a little clean water is pumped upon them, and they are suffered to stand a few minutes to drain. They are then emptied into the receiver, ready for the tubs. The tubs are taken from the platform by the crane, and placed under the receiver, filled and placed upon their respective stands, when the steam is turned upon them. If the steam be strong, forty minutes is rather above the period requisite to prepare them. As soon as they are completely done, the steam comes out at the cock, where the condensed water is let off. The steam is then taken off and the tops being also removed, the tubs are suffered to remain a short period to let the steam evaporate, which makes the potatoes dryer and better for mixing ; cut straw is put at the bottom of the stone cooler, and the potatoes poured upon it ; they are then beaten with a wooden pestle ; when more straw is put to them, and the whole is turned with a spade, and again beaten, till the whole is completely mixed. It is given rather warm. Much care and attention is requisite to clean the cooler, and also the horses mangers ; otherwise the potatoes would soon be turned sour : too much attention cannot be paid to this object. The mangers are frequently scraped with an iron instrument, made for that purpose, which permits its cleaning all the corners. In order to be able to mix a larger proportion of straw, I now steam a part of it as is practised in Scotland. Perfect cleanliness is absolutely necessary. Water is conveyed by a pipe into the tub in which the washer turns. Where water can be

112lb.; Blue potatoes, 5 bushels 3 pecks; London White, 4 bushels 3 pecks; the stitches were only three feet a part; as the summer proved so very dry, might be in their favour. I have five large pigs, (which, when fat, are expected to weigh 360lb. each) on steamed potatoes only; this food will be continued till near half fat, then some pease or bean flower will be added; they now eat 350lb. in 24 hours. I have three breeding sows, one boar, and several small pigs, supported with the same food. My six cart horses have each 30lb. a-day of steamed potatoes and cut-straw, with the addition of five pounds of carrots to each horse; they have only one bushel of oats or beans bruised, and one bushel of bran allowed per the week, and I think of withdrawing the bran, now they have carrots. I had 270lb. of this vegetable on ten yards square, and one hundred weight of tops; the summer being so very dry, proved very unfavourable to vegetable crops; my carrots had many vacant places, otherwise they would have been a much heavier crop to the prospect.

Your obedient servant,

R. S. DANSIE.

The following interesting Communication was sent me, some time ago, from a very intelligent OFFICER, who had served long in India.

DURING the last seven years of my residence in India, I served with a corps of native cavalry, and had frequent

frequent opportunities of observing the mode usually adopted by the natives of Hindoostan in their management of that useful and beautiful animal, the Horse, as respects his food and shoeing; in this latter part, viz. shoeing, the practice for many ages, both as to the shoe and nail, is that recommended by Professor Coleman, in his late elegant and useful work on that subject. Horses are never used in agriculture, and those used in the cavalry, or for pleasure, are constantly housed, and with a double collar and hind picquet. Their food is either a large species of pulse, called, in Hindoostan, Channa, which is bruised and steeped for a few hours; or a smaller kind of pulse, called Colli; this is boiled, reduced to a paste, and given in balls; there is also a third mode sometimes practised, which is equal parts of channa and barley, ground to a coarse flower, and given in balls; the quantity from ten to twelve pounds weight, in the twenty-four hours, with from twenty-five to thirty pounds of hay. It is to be observed, the horses of Hindoostan are generally under the size of the English saddle horse; the standard for the cavalry of the East India Company being fourteen and a half hands, and there is often considerable difficulty in procuring a sufficient number at that standard.

I have always been an advocate for cutting hay and straw, and bruising corn, for cattle of every description, and am convinced, that any man who has paid attention to the subject will soon see the advantage that must result from the adoption of that practice.

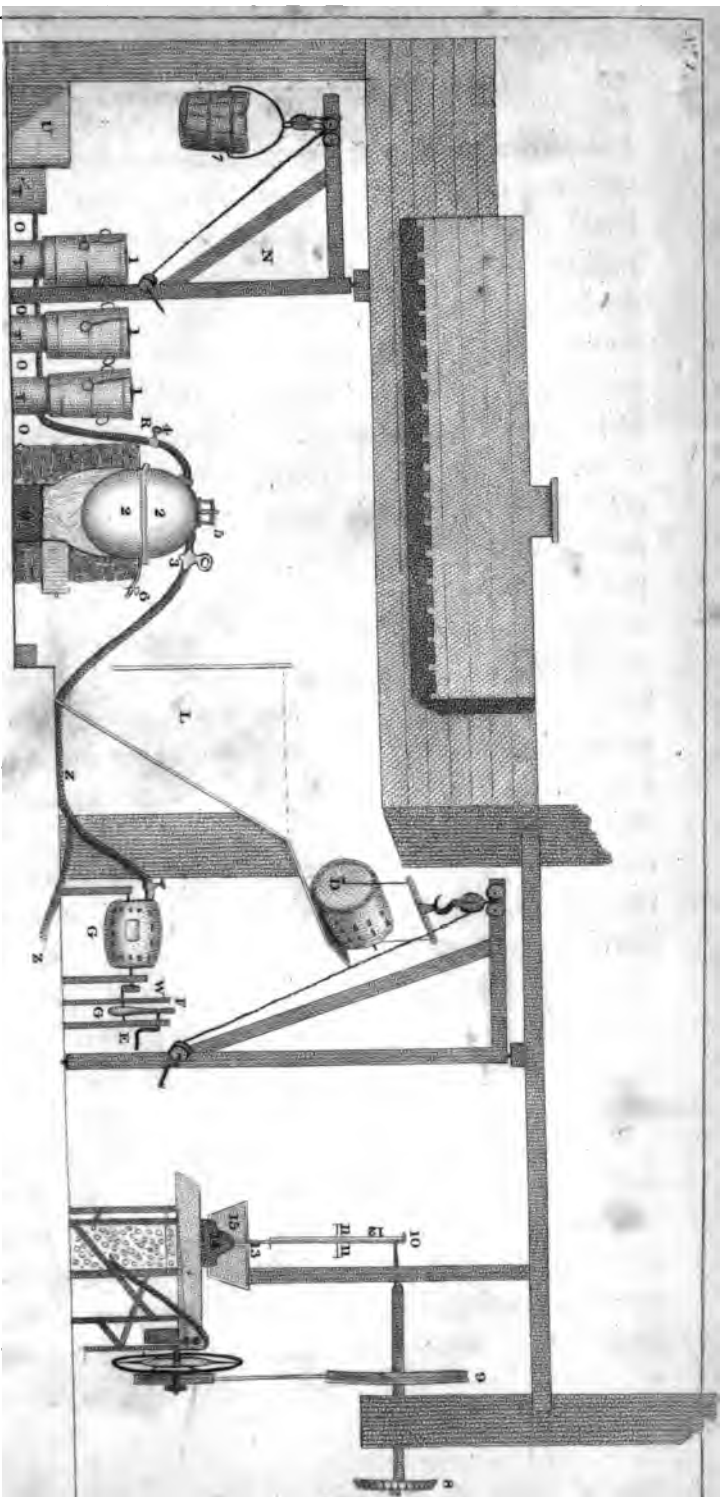
My attention was particularly called to this subject
by

by a circumstance which came under my notice when with the cavalry under Lord Lake, on the western banks of the Junna, 1804. Channa, the usual food for the cavalry, being scantily supplied, Lord Lake ordered the horses to be fed with equal parts of channa and barley, bruised and steeped in the usual way, but from the irregularity of the size of the barley and channa, and inattention on the part of those whose duty it was to see it prepared, the greater part of the barley was given entire, and passed through the stomach and intestines of the horses, apparently little, if at all, impaired in its nutritive quality.

The general scarcity of grain which prevailed at that time induced many thousands to flock to the British camp in search of food, and I daily witnessed, for weeks together, many hundreds of all ages and sexes coming into the lines of our cavalry, and anxiously collecting and carrying away the excrement as it fell from the horse; this they exposed for a few hours to the sun, and by rubbing and sifting it, procured a large supply of good food.

Process of Steaming.

THE washer being removed by the crane, to the place where the dirty potatoes are laid, is filled two-thirds (about 16 stone), and then is set into its box, and turned slowly round, the potatoes cleaning themselves by rolling down the inclined plane, which is formed by turning the washer; five minutes are more than



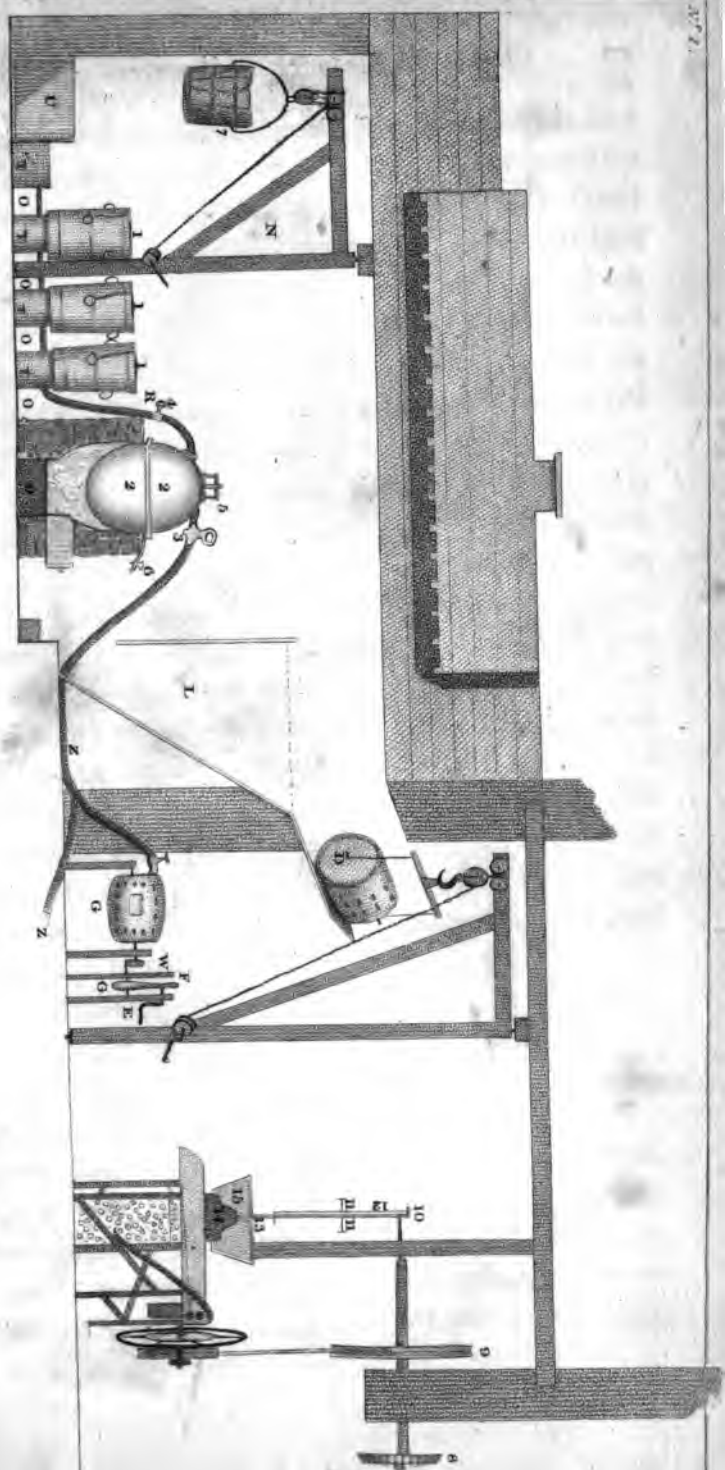
THE POTATOE STEAMER.

by a circumstance which came under my notice when with the cavalry under Lord Lake, on the western banks of the Junna, 1804. Channa, the usual food for the cavalry, being scantily supplied, Lord Lake ordered the horses to be fed with equal parts of channa and barley, bruised and steeped in the usual way, but from the irregularity of the size of the barley and channa, and inattention on the part of those whose duty it was to see it prepared, the greater part of the barley was given entire, and passed through the stomach and intestines of the horses, apparently little, if at all, impaired in its nutritive quality.

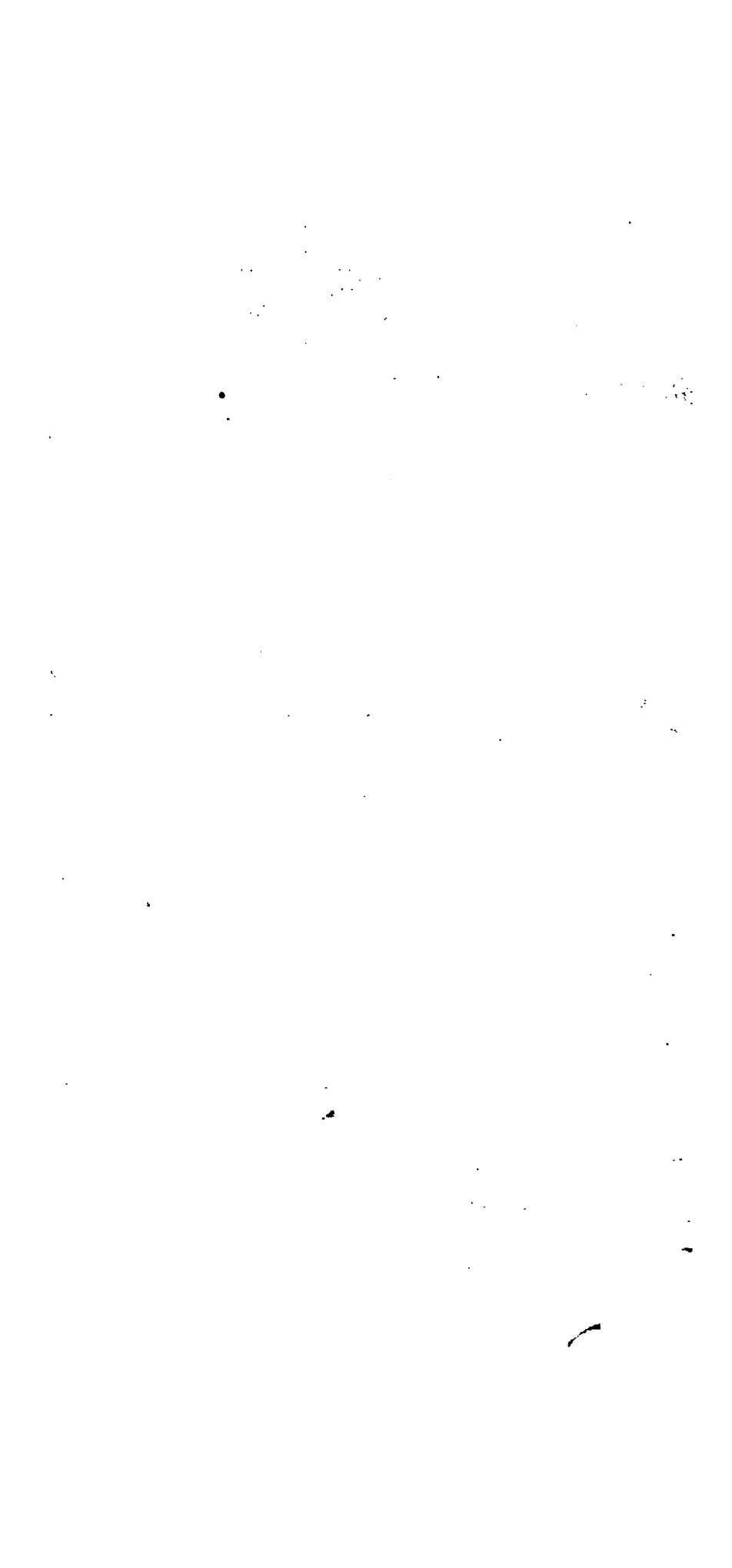
The general scarcity of grain which prevailed at that time induced many thousands to flock to the British camp in search of food, and I daily witnessed, for weeks together, many hundreds of all ages and sexes coming into the lines of our cavalry, and anxiously collecting and carrying away the excrement as it fell from the horse; this they exposed for a few hours to the sun, and by rubbing and sifting it, procured a large supply of good food.

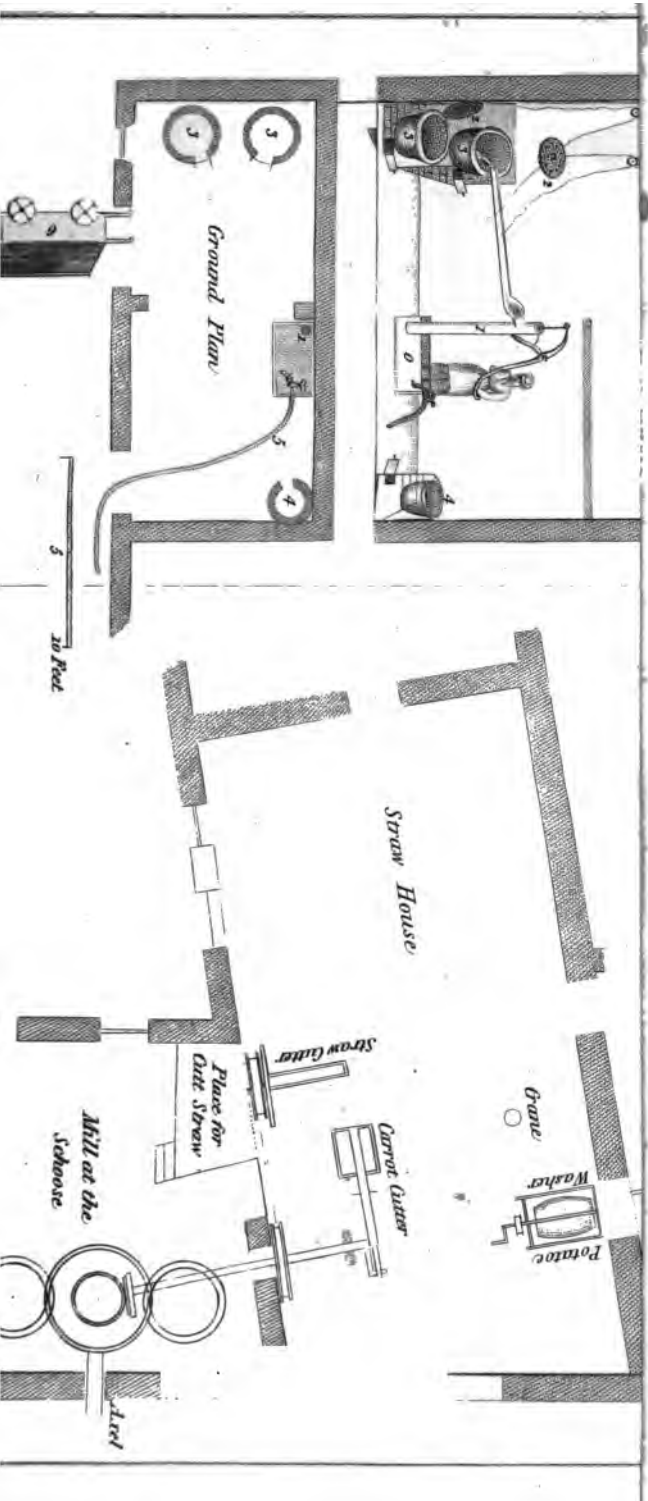
Process of Steaming.

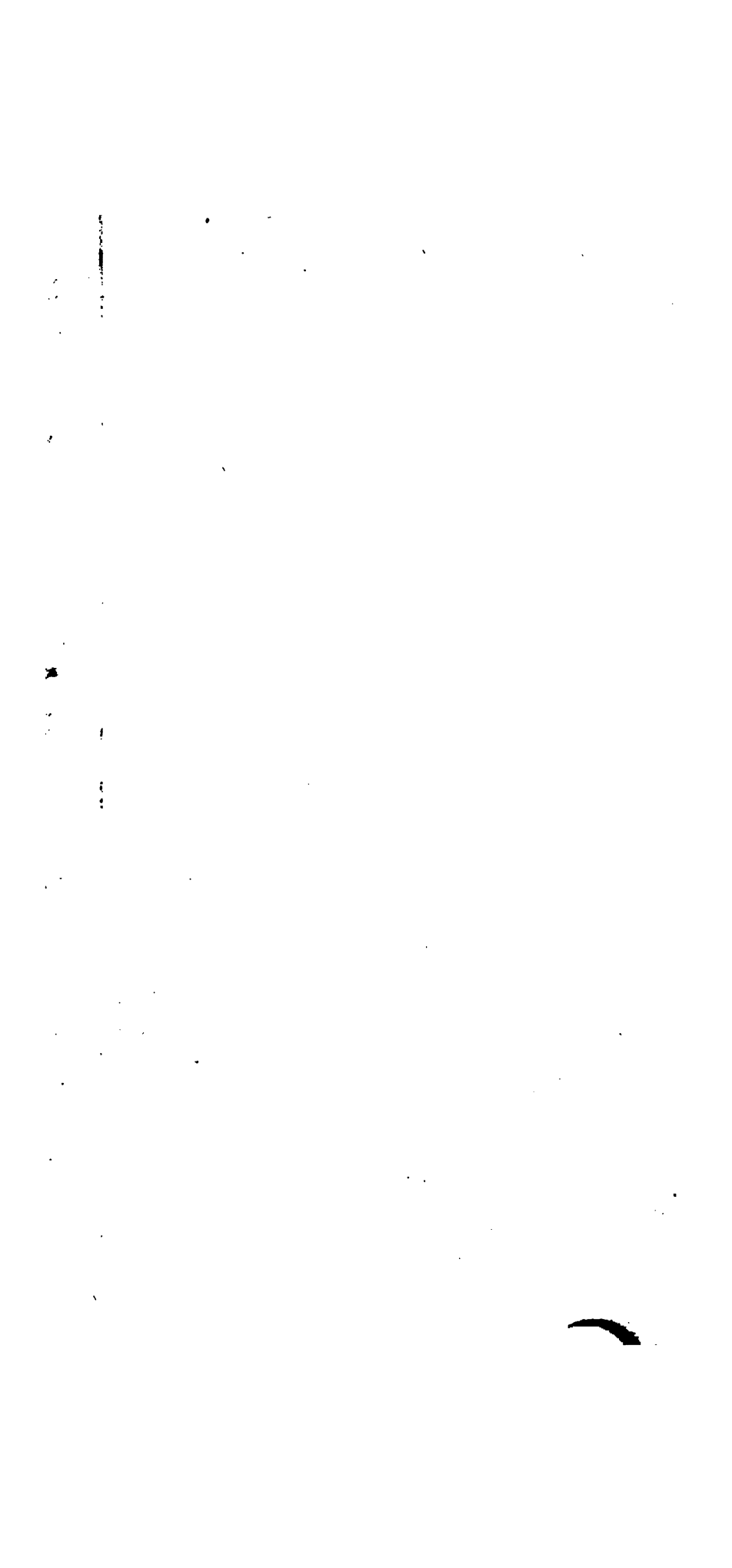
THE washer being removed by the crane, to the place where the dirty potatoes are laid, is filled two-thirds (about 16 stone), and then is set into its box, and turned slowly round, the potatoes cleaning themselves by rolling down the inclined plane, which is formed by turning the washer; five minutes are more than



THE POTATOE STEAMER.







than sufficient to clean them completely; when lifted from the box, a little clean water is pumped upon them, and they are suffered to stand a few minutes to drain. They are then emptied into the receiver, ready for the tubs. The tubs are taken from the platform by the crane, and placed under the receiver, filled and placed upon their respective stands, when the steam is turned upon them. If the steam be strong, forty minutes is rather above the period requisite to prepare them. As soon as they are completely done, the steam comes out at the cock, where the condensed water is let off. The steam is then taken off and the tops being also removed, the tubs are suffered to remain a short period to let the steam evaporate, which makes the potatoes dryer and better for mixing; cut straw is put at the bottom of the stone cooler, and the potatoes poured upon it; they are then beaten with a wooden pestle; when more straw is put to them, and the whole is turned with a spade, and again beaten, till the whole is completely mixed. It is given rather warm. Much care and attention is requisite to clean the cooler, and also the horses mangers; otherwise the potatoes would soon be turned sour: too much attention cannot be paid to this object. The mangers are frequently scraped with an iron instrument, made for that purpose, which permits its cleaning all the corners. In order to be able to mix a larger proportion of straw, I now steam a part of it as is practised in Scotland. Perfect cleanliness is absolutely necessary. Water is conveyed by a pipe into the tub in which the washer turns. Where water can
be

be commanded, the more frequently it is changed the better, which is effected by drawing a plug from the bottom. It requires so slow a motion for washing the potatoes, that I did not find it answer so well by having the machine turned by water.

TO J. C. CURWEN, ESQ.

Workington, Nov. 19th, 1807.

SIR,

ACCORDING to your order, the water exhaled from the potatoes in steaming has been tried upon a horse which was purchased for the hounds; four gallons of water from steaming was given it for some days, every morning and evening; the only effect it appeared to produce, was its operating as a diuretic; the horse was very weak when we began with him, and on the fifth day it died; I opened him, and found no defect in his stomach or bowels, nor did it appear the water given him had produced any injurious effects; nor do I believe it to have been the cause of his death, or some appearance would have been discernible.

JOHN DIXON, *Farrier.*

TO J. C. CURWEN, ESQ.

Workington, Jan. 10, 1809.

SIR,

AGREEABLE to your orders, I commenced nine days ago to give 18 quarts a day of the water that exhales from the steaming of potatoes, to a horse that was attacked with a shot of grease. I could perceive no visible effect,

effect, but by rest and attention the horse has improved in condition, and is returned to its work. The effect of this trial has confirmed the opinion entertained on the experiment of last year, that there is nothing poisonous in the water extracted from the potatoe by steaming.

THOMAS MOORE, *Groom.*

SINCE the former part of this paper was finished, the price of potatoes has advanced to 6d. per stone, with every appearance of being still higher. In consequence of this, I have found it necessary to be provided with some substitute, as I consider myself bound to stop my steaming whenever this invaluable root exceeds 6d., and to sell my potatoes to the poor. I have doubled the proportion of straw mixed in steaming, and adopted the method used in Scotland, of steaming a part of the straw. I give only one stone to each horse per day, and on Sundays substitute an additional quantity of carrots in lieu of potatoes: the saving of potatoes is considerably above one-half.

To my farm horses I now allow 6lb. of carrots, and 6lb. of oats: Colliery horses, 8lb. of hay and 8lb. of straw, cut together.

The expense of feeding is as follows:

	£	s.	d.
7lb. of steamed potatoes,	0	0	3½
6lb. of oats,	0	0	6
6lb. of carrots,	0	0	2½
A stone of straw,	0	0	2
	<hr/>		
	0	1	2
	COLLIERY		

COLLIERY HORSES.

	£	s.	d.
8lb. of hay, and 8lb. of straw;	0	0	5½
Cutting, - - - - -	0	0	1
7lb. of steamed potatoes,	0	0	3½
12lb. of oats, - - - - -	0	1	0
6lb. of carrots, - - - - -	0	0	2½
	0	2	0½

A man with a boy and horse can cut 80 stone in three hours :

Say half a day's cutting of 70 stone.	£	s.	d.
Man, - - - - -	0	1	2
Boy, - - - - -	0	0	9
Horse, - - - - -	0	2	6
	0	4	5

Or three farthings per stone.

Cost of feeding 100 horses with hay at	£	s.	d.
9d. per stone, - - - - -	3	15	0

With hay and straw mixed,	£	s.	d.
50 stone of hay at 9d.	1	17	6
50 of straw at 2d. -	0	8	4
Cutting at 0¾d. per stone,	0	6	¾
	2	12	1¾

Gain per day, ————— £1 2 10¼

How far this feeding will be found to answer, I will not pretend to say; that it should meet with opposition

tion is natural, from the aversion to every thing that is new. It will, however, be fully proved. I am the more encouraged, from the belief that a great part of the subsistence taken both by man and animals is of no further importance than to fill the stomach, for otherwise how should we account for the labouring classes being better able to support the fatigues of labour than the higher orders, whose food contains a fourth more nourishment than their's; with every allowance for habit, still there must be in their food all that is necessary for health and exertion.

Since the preceding hints on feeding of horses were prepared for the press, circumstances have occurred which imperiously command my suspending the further steaming of potatoes for the present season.

The severity with which the winter has commenced, the general deficiency of the potatoe crop, and the great injury which it has sustained by the wet, as well as the further loss of what is now in the ground by being frost-bitten, have combined to advance the price to 7d. and 8d. per stone, and to create a just cause of alarm, lest they should be much higher. A due regard to the interests and comfort of the labouring classes compels me to reserve my potatoes for their use, and to have recourse to other substitutes for feeding my horses. Though I had not half a crop, I have still on hand thirty thousand stone, which will have a powerful influence in keeping down the market price, and insuring a plentiful supply.

My

My horses being accustomed to warm food, would have suffered much from an entire change of system, particularly the aged horses; I have therefore adopted the plan of steaming cut straw, and mixing their ground oats with it, which I find they eat with avidity. I have had too little experience to pronounce decidedly on its success; but from the trial hitherto had, it has all the appearance of answering extremely well.

The failure of the potatoe crop must force conviction on the public mind, of the advantages which must necessarily result from a general adoption of my plan. Thus, food which was raised expressly for the purpose of feeding horses, may in a moment of scarcity become the support of man. How many thousands will this year participate in the benefit of it! Yet such is the infatuation of the many, that a very little matter would some years ago have induced the mob to pull down my steaming houses, and destroy my apparatus: and now, but for this plan, they would feel the most severe pressure from the want of potatoes!

The cost of feeding my FARM HORSES upon my present plan will stand thus:

	£	s.	d.
1 stone of cut straw, steamed,	-	0	0 2½
8lb. of oats,	-	0	0 8
6lb. of carrots,	-	0	0 2½
8lb. of straw,	-	0	0 1
		<hr/>	
		0	1 2

COLLIERY

COLLIERY HORSES.

	£	s.	d.
8lb. of hay, and 8lb. of straw, cut,	0	0	5½
6lb. of carrots, - - -	0	0	2½
12lb. of oats, - - -	0	1	0
1 stone of steamed straw, - - -	0	0	2½
	<hr/>		
	0	1	10½

Hay valued at 8d. per stone; 0½d. for cutting; straw at 2d. per stone.

Should I find the horses unable to perform their work upon this food, I shall make an addition of some few pounds of oats. What price hay may rise to, should the season continue with the severity it has begun, it is difficult to say. By increasing the quantity of oats, I should have very little doubt of being able to do altogether without hay; for example, hay at 12d. per stone, and oats at 14d., I should prefer six pounds of oats, with a stone of cut straw, costing 8d. to a stone of hay at 12d.

When steamed potatoes are given, the less water the horses have the better.

It will naturally be expected of me, that I should not withhold from the public the result of eight years' practice of feeding horses and work-oxen with steamed potatoes.

If it were in my power to add weight to my former opinions and assertions, I should be justified in declaring that every former predilection for the plan is strengthened, and I have the satisfaction of finding the

34 *On the Steaming of Potatoes as a Substitute, &c.*

opinions of all who are concerned or conversant with this method of feeding, completely coinciding with me in favour of it.

The suspension and resuming of the potatoes in the last year, in consequence of the deficient crop, afforded the most convincing evidence of the excellency of the food. As soon as the potatoes were taken from the horses they began visibly to fail; and their amendment was as apparent on returning to potatoes: I have this winter fed working oxen on steamed potatoes, mixed with an equal weight of cut straw, with a few turnips and 12lb. of uncut wheat straw. They have kept their condition, and stood their work better than they are reported to have done when fed on hay.

ON
THE MEANS
OF
SUPPLYING MILK FOR THE POOR.



ON
SUPPLYING MILK FOR THE POOR*.

MY LORD,

THE increased spirit with which agricultural pursuits have been carried on for some years past, in every part of the United Empire, may in no small degree be attributed to the zeal and attention of your Honourable Board.

The encouragement it has held out, has proved a powerful inducement for undertaking different experiments; and by the communications of their results to the public, much useful knowledge has been diffused.

Confiding in your experienced indulgence, and stimulated by the premium offered for the management of winter dairies and supply of milk for the poor, I beg leave to submit, with great diffidence, the result of what I have done in the last two years, towards accomplishing those objects.

The vicinity of a large and populous town had previously afforded me an opportunity of being acquainted

* Communications to the Board of Agriculture.

with the great scarcity of milk, and consequent sufferings of the poor, especially where there are young families, from the impossibility of obtaining, for the greatest part of the year, a supply at any price.

My attention had long been called to the subject, and the accidental perusal of a tract* intended to show the number of lives lost to the community for want of this salubrious aliment for young children, which, united with the encouragement given me by my friend Dr. Taylor, Secretary of the Society of Arts, &c. Adelphi, determined me on making the experiment of furnishing a plentiful supply of new milk during the winter.

I am fully aware that, to enable the public to reap any extensive advantage, it must be clearly and satisfactorily proved, that a fair and adequate profit is to be made. To increase the means of subsistence has in all instances a claim to public favour, but to entitle the plan to be recommended to the Agriculturist, it must be proved to be individually advantageous. With this view, my first enquiries were directed to ascertain the most usual modes of feeding dairy cows during the winter months, in the neighbourhood of large and populous towns, as also the expense attending it.

I found, wherever any quantity of milk was supplied, that the principal dependence was upon grains got from breweries or distilleries, and there was no other method known by which it could be obtained in any profitable quantity.

* By Samuel Ferns, M.D.

The daily expense of the feed of a milch-cow, near London, is estimated, during the winter months, at two shillings per day. The usual allowance as under:

<i>Weight of Food.</i>			£	s.	d.
<i>St.</i>	<i>lb.</i>				
5	2	One and a half bushel of grains	0	0	9
6	6	Two bushels of turnips, at 5d. per bushel	0	0	10
0	12	Twelve pounds of hay	0	0	5
<hr/>			<hr/>		
12	6		0	2	0

A bushel of grains weighs 3 stone 10lb.; turnips, 3 stone 3 lb.; the London grains may probably not be so heavy, as they have a better method of extracting the farinaceous matter from them than what is practised in country breweries.

Where hay alone was given, or in chief part, I was not so fortunate as to be able to find a single instance, in which any steps had been taken to ascertain the quantity consumed in 24 hours in the feeding one, or any number of cows; or the supposed expense attending it. The answer my enquiries received, in one of the first dairy districts near to London, where hay only is used, was, "That they gave just as much hay as the cows would eat." From the few trials I have made with the long-horned cattle, I am inclined to believe a milch-cow would consume, in the twenty-four hours, from two stone to two stone and a half of hay.

The objections against feeding with hay, are, First, the expense, which is much too high in the situations

where milk is most required, to enable the dairy-man to afford it, either in sufficient quantities, or at a price to benefit the poor. Secondly, there are besides, few populous towns so circumstanced as to admit of a sufficient quantity of hay-ground being procured for the support of extensive winter dairies; but, Thirdly, supposing it could be had, the superior profits to be made by a summer dairy would decide in favour of applying it to that purpose.

Most farmers consider it as more profitable to make butter in winter, than to sell their milk. I strongly suspect their calculations on this subject not very correctly made, as I shall endeavour to show.

Having no means of procuring grains, and the price of hay precluding the possibility of employing it in feeding milch-cows with any prospect of advantage, I was driven to the necessity of adopting some other method. One of the most experienced breeders and feeders of cattle in the county of Durham, or probably in the kingdom, Mr. C. Mason, is of opinion, that no animal will pay the expense of feeding on hay at 2d. per stone, in which I entirely agree with him. This opinion has since been confirmed by Mr. Elman, and various other persons of great practical experience.

On the first proposition for substituting green food for the support of my dairy in winter, I was discouraged by a very prevalent opinion, that cows could not be kept in condition or health on this food alone. I should most probably have declined the attempt, had I not witnessed the complete success of other experiments

ments as much at variance with received opinions and common practice.

Having matured my plan, I determined to appropriate twenty-two acres of land, within less than a mile of a town containing eight thousand inhabitants, with a view of raising green crops for the purpose of supplying it with milk, and for the support of my other stock, during the winter months. I was in a great measure ignorant of the quantity of green food that would be required for each head of cattle.

The ground was cropped with four acres of drum-head cabbages; six acres of common red turnip; two acres of Swedish turnip; one of kohlrabi; and nine acres of coleseed. The milch-cows were turned out in good weather into a dry sheltered pasture of sixteen acres, which had been so hard stinted, as to afford them little or no food, but had the advantage of plenty of good water.

In the beginning of April, 1804, the cabbages were transplanted: by this early planting they have always succeeded better than those of my neighbours which were later set. The turnips were sown by the drill, in stitches at three feet distance, and the utmost attention paid to the cleaning of the whole, not only for the benefit of the present crop, but for that of the succeeding ones. The turnips proved a failing crop in many parts; the other green crops were very productive and weighty.

The stock of cattle fed in sheds consisted of thirty-three; twenty-two milch-cows, eight of them had been spring calvers, the remainder heifers. I notice this circumstance,

circumstance, to account for the apparent smallness of the quantity of milk afforded, in proportion to the number of milch-cows.

I was so circumstanced, as to be compelled to dispose of the greatest part of my stock before my winter crop was exhausted; having no preparation for soiling them in the house during summer, nor any distant pastures of less value than the lands I occupied near to the town, to continue them for another season. Much of the success of the experiment depended on the condition the stock should be in, to enable me to dispose of them early, and with little loss. I have been amused at the various objections which have been brought forward against my mode of feeding milch-cows.—What has been most strongly urged, is, the injury to their health, by constantly keeping them in the house. One gentleman gravely brings forward an instance of a farmer's losing 28 milch-cows out of 120, by feeding them on potatoes, and supposes the advantage of feeding my colliers cheaply, makes the loss of a few milch-cows of no consequence.—In four years, I have lost but one cow, and that from a blow: In no instance have I ever seen any reason to believe the health of the cattle to be injured; on the contrary, their condition is superior to that of any neighbouring stock. What was said of them last year, by a farmer and miller of extensive practice, is a just description, that the milch cows were in such condition he should have supposed them “miller's cows, with the public for their feeder.” The heifers I have annually sold, have been in such forward condition, as to bring nearly
their

their original cost. I had eight three-years old heifers, intended to be kept for stock; a bull and four cows for fattening; and besides these, I wintered thirty-five head of Highland heifers, and sixty-five sheep.

In dry and moderate weather, the milch-cows remained out from ten o'clock till towards evening. From their being kept in open sheds they were less sensibly affected by the cold. A greater degree of warmth is supposed to be favourable to their milking; but I do not believe, so kept, they would have been in such thriving and healthy condition.

The first cattle sheds erected at the Schoose were with open arches. Experience has taught me that a draft of cold air is very injurious to milch cows, and greatly prejudicial to their milking. A further fault was that the sheds were not sufficiently lofty; in consequence of this, the heat from the reflection of the sun on the roof distressed the cattle in summer. The sheds were also too narrow, and had no contrivance to collect and preserve the urine. These I have taken down and rebuilt; they are now so lofty, as to prevent the cattle being too warm, or suffering from partial drafts of air. The urine is preserved, and collected in pits, from which it is pumped into barrels, and taken to saturate the mould. Latterly the potatoe-halm has been collected, and brought into a yard, and on these the urine is thrown, by which means it is converted into very good manure: such of the halm as can be got perfectly dry, we use in spring for litter.

I found it advisable to make use of the cabbages first: they required much labour and unremitting attention

tention in freeing them of decayed leaves ; and after frost, the difficulty is still greater ; it is, however, indispensably necessary, in order to prevent the milk from being tainted.

I had last year thirty-five tons and a half of cabbages per acre, or 2352 plants at a distance of four feet and a half from each other, and with but fourteen tons of manure ; some of the cabbages weighed 55lb. : the same ground has this year produced sixty Winchesters of barley, for one sown with Mr. M'Dowell's drill.

The last two years, I have not been successful with cabbages, the severity of the winter having destroyed my young plants. Cabbages are a great convenience in case of a long duration of frost, when turnips cannot be procured. The 1000 headed cabbage I have found answer a tolerable purpose, but I have no idea of their repaying the labour of stripping the leaves.

The cabbages planted were the drum-head cabbage. I wish an equal weighty and more hardy kind could be obtained, that would stand the winter better, as the cost of cleaning and stripping the decayed leaves tends greatly to reduce their value.

The common turnip followed ; next the Swedish and kohlrabi ; and last the coleseed. This latter article of food I found to be most productive of milk, and it has the further advantage of standing till the end of May, and latterly to the middle of June, by which time lucern is fit to cut.

I made a further experiment in feeding milch-cows, by giving oil cake. This novelty encountered still greater prejudice. On trial it soon appeared that the
milk

Milk was considerably richer, its flavour not affected, and the quantity also much increased.

An attempt was made to prejudice the public against the Schoose milk. The children (no doubt set upon doing it) followed the cart, crying out, "oil-cake milk." A little experience soon overcame the prejudice, and it is now sought for from its superior richness, in preference to any milk brought to the town.

To this I attribute the uncommon condition of the whole stock so fed. The certificates, which accompany this, will be fully satisfactory upon that point.

My dairy commenced the 1st of October, 1804, and continued constantly supplying the town till the 18th of May, 1805. As a part of the heifers were not purchased till late in October, the whole not in milk till the middle of November, I have extended the period thirty days above the two hundred, upon which the calculation of food is founded, to complete that period for the whole stock; and allowance must be made for this small excess.

The time of milking in the morning was between six and seven; immediately afterwards, a feed of cabbages was given, as long as they lasted. At ten o'clock, previous to turning out, two pounds of oil-cake each. In favourable days they had turnips in the pasture, with the tops and tails cut off; on returning to the sheds, they were served with cabbages; between that time and four they were milked: this was followed by a second allowance of two pounds of oil-cake each; afterwards a third feed of cabbages; and

at

at six o'clock a foddering of straw from six to eight pounds.

The labour of cutting off the tops and tails of the turnips was amply compensated by the advantage of feeding the wintering Highland cattle with them in preference to straw.

The expense of green food does not stand the farmer in one halfpenny per stone; the tops and tails of the turnip must be considered of still less value, whilst straw cannot be estimated under two-pence. I have with some difficulty introduced the purchasing of straw by the stone. The price has been advanced to $2\frac{1}{2}$ per stone. By weight the purchaser knows what he gets; whilst sold by the wisp, it depended on the character and feelings of the seller, and was cheap or dear accordingly. Notwithstanding the disparity of cost, there is still a greater difference in their nutrition. What I wintered as above, upon the refuse of green food, were in condition for killing two months earlier, and exceeded any of the same kind I ever had, both in weight of carcase and tallow, and brought from two to three pounds per head more than I had ever obtained for the like stock at any former period.

The plan I followed in estimating the profits upon the experiment, was, in the first instance, to put a value on the green crop, supposing it to be sold by the farmer to the milkman; and afterwards to unite together the two profits. I may be supposed to have over-rated the cost as well as the value of the green crops; this, however, is matter of opinion, and must depend in a great measure upon situation. An acre
of

of turnips in Northumberland or Durham is often sold from eight to ten guineas, to be eaten off the ground. The cost of cleaning drilled turnips much exceeds the broadcast, yet I have no doubt whatever, the weight will amply compensate for the expence, and put the land in much superior condition for future crops ; and, when the drill husbandry is properly attended to, will greatly exceed the general estimate of fifteen tons per acre. I shall endeavour to ascertain this fact against another year.

The resulting profit upon the milk falls short of what I expected, and what I am confident it might and ought to have been, under proper management. It is sufficient, however, to encourage the hopes at first entertained, of the practicability of the measure, and to determine me to proceed with the experiment. Some facts which have since come to my knowledge, have proved I was justified in the opinions I entertained, that the profits ought to have been much larger.

With the experience I have gained, I have no doubt I shall exhibit a very different result of profits in the next year's trial.

Value of the Green Crop, upon a supposition of its being sold to the cow-keeper.

Twenty-two acres of green crop, at 10l.	£	s.
per acre - - -	220	0
Carry over	220	0

	£	s.
Brought forward	220	0
Estimate of expense attending the raising of each green crop, with cleaning, &c.		
Four acres of cabbages, at £ s.		
12l. per acre -	48	0
Two acres of Swedish turn- nips, at 5l. per acre -	10	0
Six of common red turnips, at 4l. per acre -	24	0
One of kohlrabi -	5	0
Nine of cole seed, at 3l. 10s. per acre -	31	10
	<hr/>	118 10
Gain on the crops -		<hr/> 101 10

The improvements in the land and value of succeeding crops is supposed to be adequate to the rent and taxes.

Value of the land, 40s. per acre.

Poor cess, under 1s. 6d. in the pound.

Expense of feeding Twenty-two Milch-cows for 200 days.

Each acre is supposed to produce 15 tons, or 2400 stones.

Allowing four stones of green food, to each cow per day, for 200 days, would require seven acres.

Seven

On supplying Milk for the Poor.

49

Seven acres of green food, at 10 <i>l.</i> per acre	£	s.	d.
- - - - -	70	0	0
Four pound of oil-cake each, for 22 milch-cows, 200 days	69	8	0
Straw ditto, at 1 <i>d.</i> per day, ditto	18	6	8
Attendance, at 40 <i>s.</i> per head	44	0	0
Interest on capital, valuing each beast at 13 <i>l.</i> , 8 <i>l.</i> ; expense of purchase, 3 <i>s.</i> , 3 <i>l.</i> 6 <i>s.</i>	11	6	0
Risk and loss by resale, after the rate of 30 <i>s.</i> per head	33	0	0
By profit of milk	47	2	8
	<hr/>		
	293	3	4
	<hr/>		

Had the cows been tolerably well managed, the profits would have been double at least.

Money received for the Produce of twenty-two Milch-cows for 200 Days.

	£	s.	d.
By milk, butter, and calves sold	224	0	0
Two calves reared with milk	20	0	0
Supplying five persons in farm-house, at one quart each per day	4	3	4
600 carts of manure, at 1 <i>s.</i> 6 <i>d.</i>	45	0	0
	<hr/>		
	293	3	4
	<hr/>		

E

Oil-cake

Oil-cake is too costly to be given with advantage, except to cows in full milk.

The eight spring calvers so fed, at a cost of 26*l.* 13*s.* 4*d.* gave so trifling a quantity of milk, that three parts of this expense might have been saved, and the profits would then have been above 60*l.* Six calves were lost, which was a further deduction of 12*l.*

It will appear obvious, from the sum charged for rearing two calves, that breeding cannot be attempted with a view to profit, where milk can be sold at 2*d.* per quart, wine measure.

Expense of feeding Stock upon fifteen Acres of Green Food.

Estimated cost of 15 acres of green food, £	s.	d.
at 10 <i>l.</i> per acre	-	-
	150	0 0
Eight three-years old heifers intended for breeding, fed with oil-cake, 4 lb. per day each	-	-
	26	13 4
Three cows fattening, 7 lb. ditto per day each	-	-
	16	13 4
Carting turnips to the above, and wintering stock	-	-
	28	15 6
Interest on value of the above estimated at 400 <i>l.</i> , expense of purchasing included	12	11 0
Gain upon stock	86	16 10
	321	10 0

Manure

Manure from feeding with oil-cake is of double the value of common cow-dung.

Gain upon sale of the Stock on 200 Days' feeding.

Three cows fed 200 days, cleared	13 <i>l.</i>	£	s.	d.
each; cost of feeding 10 <i>l.</i> ; profit 3 <i>l.</i>	39	0	0	
Twenty wintering Highland heifers, cleared				
3 <i>l.</i> 10 <i>s.</i> each; cost of feeding 1 <i>l.</i> 10 <i>s.</i>				
profit 2 <i>l.</i>	70	0	0	
Fifteen fat ditto killed in six months, cleared				
4 <i>l.</i> each; cost of feeding 1 <i>l.</i> 10 <i>s.</i> ; profit				
2 <i>l.</i> 10 <i>s.</i>	60	0	0	
Sixty sheep, cleared 10 <i>s.</i> each; cost of				
feeding 6 <i>s.</i> ; profit 4 <i>s.</i>	30	0	0	
Eight three-years old heifers, fed equal to				
milch cows, supposed to make an ad-				
vance of 10 <i>l.</i> ; feeding 7 <i>l.</i> ; profit 3 <i>l.</i>	80	0	0	
One bull, feeding 10 <i>l.</i> supposed advance				
5 <i>l.</i>	15	0	0	
300 carts of manure, at 1 <i>s.</i> 6 <i>d.</i> per cart	22	10	0	
Half an acre of Swedish turnips for horses	5	0	0	
	321	10	0	

The feeding stock, after the rate of the three-years old heifers, can never answer at the common prices of cattle.

Expense of attendance on Milch-cows and other Stock
for 200 Days.

	£	s.	d.
Dairymaid's wages - - -	5	0	0
Board wages - - -	9	0	0
One man and horse, for sale of milk and leading green food, at 4s. 6d. der day	45	0	0
One labourer, at 9s. per week -	18	10	0
	<hr/>		
	72	10	0
	<hr/>		

Cost of feeding Milch-cows per Day.

	s.	d.
4 stone of green food, at 1d. per stone -	0	4
4 lb. of oil-cake, at 1d. per lb. -	0	4
8 lb. of straw - - -	0	1
	<hr/>	
	0	9
	<hr/>	

The feeding cattle had 7 lb. of oil-cake, which made the expense of these 1s. per day. The dairymaid's wages were wholly charged to the milk account, though by much the greater part of her time was employed in the farm-house. Some occasional assistance in milking was given, but by no means equal to what is overcharged to the dairy on her account.

Twenty pounds of butter were made per week, by which, I am very confident, I was a considerable loser. The skim-milk was included in the butter account,

count, and the quantity sold, not ascertained. New milk was sold for 2*d.* per quart, wine measure; skim milk for 1*d.*

There were sold during the whole period, 17,410 wine quarts; on an average 87 quarts per day. The demand was so great that the milk-cart was met before it reached the town, and the whole disposed of, morning and evening, in little more than an hour. The daily sale of this winter (1807) 180 quarts.

The forward condition of my heifers made them sell early in the spring, and with less loss than I expected. I have formed my estimate on what I am told would be a fair average, one year with another; the price of cattle in the spring depending upon the season, and the quantity of fodder which remains on hand.

It was allowed by the dealers and others, there was no stock in the neighbourhood, however fed, that were in any thing like the condition of mine. To be able fully to ascertain and establish this fact, is to remove a very weighty objection to the plan. Supposing the profit of the farmer and milkman united:

	£	s.	d.
Gain upon 22 acres of green crop -	101	10	0
Ditto on milk 47 <i>l.</i> 2 <i>s.</i> 8 <i>d.</i> Ditto on win-			
tering stock 86 <i>l.</i> 16 <i>s.</i> 10 <i>d.</i> -	133	19	6
	<hr/>		
	235	9	6
	<hr/>		

Had the whole been well conducted, the profit should have been 300*l.*, out of which taxes, rent, &c. must be deducted.

Let us suppose thirty-three head of cattle to have been fed on hay, and that each consumed two stone per day ; estimating the produce of an acre of hay at one hundred and sixty stone ; at this rate it would have required eighty-two acres to have fed them for 200 days, admitting the after-grass to have been adequate to the support of thirty-five head of Highland heifers, and sixty sheep for the like space of time. If I am correct in this calculation, there will be found a clear gain to the public of sixty acres of land in the feeding of this trifling stock.

A moderate acre of green food is supposed to produce 15 tons, or 2400 stone ; but with the drill husbandry, I conceive the weight will be considerably greater.

I have not thought proper to make any alteration in the preceding statement of the supposed weight of green crop, but suffered it to remain as an example of the danger of arguing from any thing but actual experience. Fortunately for the position I maintained, the green crops under my own inspection (obtained with coal ashes) greatly exceed the data upon which I calculated. Subsequent information obtained of the weight of turnip crops in Durham and Northumberland, offers a further confirmation of the value of green crops. I am much indebted to my ingenious and intelligent friend, Mr. G. Taylor, of St. Helen's, Auckland, for the following valuable communication of an experiment made by the Durham Society for Agricultural Experiments, and for the permission granted me by the Society to make use of them.

Report

Report of the Result of an Experiment on Turnips, 1803.

Kind of Turnip, and mode of Culture.	Weight, per acre, computed from actual weight on eight square yards, Broad Cast, and about forty-six Drilled.												Proportion of Bulb in the weight of both.	Reduced proportion of the weight of Bulbs.	Specific gravities of Bulbs, Nov. 30, 1803; average of three sizes.
	Of Bulbs.		Of Tops.		Of both.										
	Tons.	Cwt. St. lb.	Tons.	Cwt. St. lb.	Tons.	Cwt. St. lb.	Tons.	Cwt. St. lb.	Tons.	Cwt. St. lb.	Tons.	Cwt. St. lb.			
Yellow Bullock, Broad Cast.	34	16 6 8	6	9 5 1	41	6 3 9								2.108	.907
Ditto Drilled at 30½ Inches.	29	18 0 0	4	5 3 5	34	3 3 5								1 809	
Swedish Broad Cast.	16	14 7 3	3	15 4 13	20	10 4 2								1 013	1.019
Ditto, Drilled at 30½ Inches.	16	10 4 6	2	13 6 11	19	4 3 3								1 000	
Norfolk White; Broad Cast.	28	17 7 12	12	1 7 5	40	19 7 3								1.748	.922
Ditto, Drilled at 36½ Inches.	32	10 0 0	8	5 2 3	40	15 2 3								1.966	

REMARKS.—The soil a sandy loam, all manured alike, and sown at the same time. The yellow bullock, broad cast, supposed to owe its superiority to the drilled, being hoed at the usual distance; whereas the top being very small, the distance ought to have been less, a circumstance not known then, but which showed itself, and was allowed for in the broad cast — The yellow bullock found not to stand the frost.

Nov. 30th, 1803.

C. MASON, Experimenter; L. SEYMOUR, and W. TAYLOR, Visitors.

Report of an Experiment on Turnips, in 1803-4.

Kinds of Turnips and mode of culture.	Weight, per acre, computed from actual weight of eight square yards, in Broad Cast, and about forty-six in Drilled.			Proportion of Bulb in the weight of the whole plant.	Reduced proportion of weights of whole plants on an acre.	Reduced proportion of weights of Bulbs on an acre.	Specific gra- vity of Bulb, vity of Bulb, on an average on an average of 3 sizes, on of 3 sizes, on Nov. 28, 1803. Mar. 28, 1804.	Specific gra- vity of Bulb, on an average on an average of 3 sizes, on of 3 sizes, on Nov. 28, 1803. Mar. 28, 1804.
	Of Bulbs.	Of Tops.	Of both.					
Yellow Bullock, Broad Cast.	Tons. Cwt. st. lb.	Tons. Cwt. st. lb.	Tons. Cwt. st. lb.					
	34 16 6 8	6 9 5 1	41 6 3 9	,843	2.149	2.103		
Ditto, drilled at 30½ Inches.	29 18 0 0	4 5 3 5	34 3 3 5	,875	1.777	1.809	,907	,790
Swedish, Broad Cast.	16 14 7 3	3 15 4 13	20 10 4 2	,815	1.067	1.013		
Ditto, Drilled at 30½ Inches.	16 10 4 6	2 13 6 11	19 4 3 3	,859	1.000	1.000	,109	,966
Norfolk White, Broad Cast.	28 17 7 12	12 1 7 5	40 19 7 3	,704	2.133	1.748		
Ditto, drilled at 30½ Inches.	32 10 0 0	8 5 2 3	40 15 2 3	,997	2.120	1.966	,922	,770

REMARKS.—The soil was a rich sandy loam, manure the same to all. The superiority of weight in the broad cast yellow bullock and Swedish, is supposed to have arisen from the smallness of top in these kinds, which was allowed for in heeling the broad cast, but could not be equally allowed for in the drilled, because the latter are "set out," or hoed, for the first time, at an earlier period, when the difference of top is not obvious, nor had this difference been adverted to in regulating the stitches. In the Norfolk white, to which the labourers had been accustomed, the drilled appear with their usual superiority.

J. B. FENWICK, and JAMES CLARK, Visitors; C. MASON, Experimenter.

Weight of Turnips and other Green Crops at the Schoose, 1807.

	Weight of Bulbs.		Ditto of Tops.		Total.		Width of Stitches.		Number of Turnips in the Acre.		Mean Weight.		Square of each Turnip.	
	Tons.	St.	Tons.	St.	Tons.	St.	Inches.				St.	lb.	Inches.	
Red Turnip	27	38	11	112	39	0	32		12719		0	6½	13½	
Yellow	35	134	4	66	40	40	32		19987		0	4½	8½	
White	29	125	4	129	34	94	32		18171		0	4½	9½	
1000 Head Cabbages	26	80							2352		1	11½	74	
Cabbages	35	80							2352		2	6	74	
Cole Seed	13	0												
Kohlrabi	25	141							14520		0	4	12	

I have yet to prove how far the 1000 headed cabbage will pay the expense of gathering; should it do so, it will be a most valuable plant; the leaves are not so subject to decay as the cabbage.

In contrasting the above with the Durham crops of turnips, it will appear that the weight of top, in the broad cast, greatly exceeds those in the drill; I am strongly inclined to believe, by continuing the working with the plough and harrow for a greater length of time, an equally heavy crop might be obtained on the four-foot stitches. The red turnip is not esteemed, in consequence of its weight of top. The yellow will not stand the weather. The soil a strong loam, inclinable to clay. The turnips after wheat, which followed potatoes.

I have been favoured with the following account of the weight of an acre of turnips, the property of Mr. JOBBINGS, for which he received the premium, at the Ovingham Agricultural Meeting, in Oct. 1807.

	Tons.		Cwts.		lbs.	
Weight of Bulbs	-	45	6	66		
Tops	-	11	1	66		
Roots	-	0	17	46		
Total					57	5 0

WEIGHT OF GREEN CROPS, (PER ACRE,) 1808.

	WEIGHT.	BULBS.	TOPS.
	Tons.	Tons.	Tons.
Winscales white globe turnips.	48	34 :	14
Hunday white globe turnips.	33	20 :	13
Cole, broadcast, sown Oct. 17.	14 96	— :	—
Do transplanted, which had failed. ...	9	— :	—
Swedes, sown in drills, Nov. 9.	34	27½ :	6½
Do transplanted.	40	33 :	7
The worst transplanted.	15½	10½ :	3
The worst in drills.	11½	9½ :	2
Hundred-headed cabbages.	18	— :	—
.....	11½	— :	—
Kohlrabi.	7	— :	—
Carrot tops.	4½	— :	—
<hr/>			
Mr. Bates's (of Halton Castle) white globe turnips.	56	47 :	9
Mr. Mason's (of Chilton) Swedes.	27	23½ :	3½
Mr. Atkinson's (of Staingills) Swedes, which got the premium. Stitches, 24 inches.	48	40 :	8

* * *Weighed in November.*

Mr. Bates's crop obtained the premium at Ovingham.

After the rate of four stone per day, an acre would supply food for one beast for 600 days. At the rate of two stone of hay per day, it would require seven acres and a half; but say seven, allowing the half acre for the straw likewise given. We ought, in striking the balance in favour of green crops, to take into the account its impoverishment of the ground by hav, and the improvement by green crops. The drill husbandry, under judicious management, is the best mode of improvement, and might be alternately practised with green crops till the end of time.

I assume,

I assume, and in so doing I believe I rather under than over-rate green crops in stating the comparative scale of feeding with hay, as seven to one.

The expense attending the making and getting of hay is, in many parts of the kingdom, very great, and liable to much disappointment, both as to quantity and quality. In the north of England greater comparative losses are sustained, from the effect of climate, in saving our hay than even our grain. There are many chances in favour of green crops, from their being sown at different seasons, and, in case of failure, the being able either to change or to renew them.

The advantages of feeding with green crops are, the saving of rent, and the profits of a great stock upon a small quantity of land. Some deduction from this may be stated for the additional buildings which would be required for stall feeding and soiling; but this would be trifling, and bear no proportion to the returns it might fairly be expected to make, and the rents which would be consequently given in consideration of these conveniencies.

Potatoes and carrots, &c. will exceed seven times the comparative feeding of hay; and both these crops have the further advantage of being conveyed by water carriage, with comparatively little risk, from districts where rents are from 15s. to 20s. per acre, to places where five or six pounds are paid, and labour proportionably high.

What encouragement does this hold out for the improvement of lands distant from populous towns, that have the advantages of water-carriage!

Summer

Summer soiling, in comparison with grazing, will equal, if not exceed, the proportion of seven to one, besides the almost incalculable advantage of preserving the manure, and having the stock in better condition, and less liable to accidents,

I cannot omit stating the great profit of carrots. I have found, by the experience of the last two years, that where eight pounds of oat feeding was allowed to draft horses, four pounds might be taken away and supplied by an equal weight of carrots, and the health, spirit, and ability of the horses to do their work be perfectly as good as with the whole quantity of oats. With the drill husbandry and proper attention, very good crops of carrots may be obtained upon soils not generally supposed applicable to their growth. Under proper management, an acre of carrots will produce, in favourable seasons, 2000 stone, which, at 6*d.* per stone, would amount to 50*l.* besides the tops.

A saving of sixty acres of land in a farm of six hundred, in the feeding of cattle alone, opens a wide field for speculation. The retrenchment of a tenth, with a gain to the public of the means, if applied to the growth of corn, of supporting in bread one hundred and eighty persons, cannot fail of calling forth serious reflections, and challenging attention to the important advantages which might be drawn from the general adoption of this system.

Jan. 1806.—In the experiments of the preceding year, I had many difficulties to combat; great prejudice prevailed against the plan, and I was myself unacquainted

acquainted with every thing relative to the dairy. By the pains and attention bestowed upon it, I trust I have gained such a knowledge of the subject, as to give the present trial a fairer prospect of success.

In the last year, I was obliged to dispose of most of my heifers, having no preparation made to continue the keeping of them in summer, nor distant pastures where they might be grazed at a small expense, not exceeding forty or fifty shillings a head from May till October. From the experiments on soiling of the present year, I am convinced, I can keep horses and cattle in the house upon land worth 3*l.* per acre, cheaper than I can pasture them on ground worth 10*s.* and with considerably less risks. There is a risk in heifers how they may milk, and they never give so much as after the second or third calf. Being now enabled to keep such of the heifers as promise to milk well, a great risk is avoided, and the profits upon the same number of milch cows will be greatly increased without any additional expense. The average loss allowed for, would pay for the summer's grass. There is also a further advantage of having the stock more exactly in milk at the period required.

In all extensive corn farms, there is not only a large quantity of chaff, but much refuse corn seldom used, except for poultry: these mixed and steamed, make admirable feeding for cows, greatly promote their milking, and can scarcely be considered of other cost beyond the preparation. When I had no refuse corn, I made use of a small quantity of bran. I tried many experiments to dissolve oil-cake by boiling, but I could

could not succeed. I am now about erecting a mill to grind it, in order to dissolve and mix it with the chaff. I have no doubt of being able, by this means, to make a great saving ; I expect half what I now give will answer every purpose. The period fixed for the delivery of this report will prevent my being able to ascertain this, or to state the ultimate result of the produce of my green crop. Since the beginning of November, I have received from ten to eleven guineas per week for milk, and I expect it will continue to produce that, or more, for two months to come. Should the Board at any future period require further information, I shall be happy to afford it.

On the first of October, I recommenced my dairy; the preparation for it, of green food, were as follows :

Eight acres of cabbages,
Ten acres of red turnips,
Two acres of Swedish,
One acre of kohlrabi,
Twelve of cole-seed.

The cabbages were delayed planting (from the extreme dryness of the season) till the beginning of May, which was a full month later than my usual time. They have proved the lightest crop I ever had, which confirms my predilection for early planting. They stood till the last week in January. The stripping them of decayed leaves requires a great deal of labour. The drum-head cabbage was what I planted ; a hardier kind would answer better for standing the winter. I should be much inclined to try some of the

Scotch

Scotch coles, which, by proper care, might, I suppose, be increased to a large size, and would stand late. The turnips proved a very admirable crop. Agreeably to my former intention, I made several trials of ascertaining the weight of an acre of drilled turnips: I weighed various plots of ten yards square, in different parts of the field, and found their several weights (differing very little) to give about 108 stone each, which is 32 tons and upwards per acre. There are many crops in the neighbourhood equally weighty, though none, perhaps, quite so clean. They succeeded wheat, and had about twenty carts per acre of ashes and street-rakings. They were sown in stitches, three feet asunder; the whole was worked from July till the end of September, with the double mould-board plough and potatoe-harrow, alternately taking the soil from the turnips, and returning it to them. The stitches were, besides, twice hand-weeded and thinned. This mode of cultivation is attended with considerable expense, but I conceive it to be amply repaid both in the present and future crops.

Thirty-two tons per acre, at a farthing per stone, brings them to 5*l.* 6*s.* 6*d.* The estimate of 10*l.* an acre is moderate, as the turnips cost at that rate under a halfpenny per stone, which is but a fourth of the price of straw. In Durham and Northumberland, from 5*l.* to 10*l.* per acre are the common prices. In Cumberland, from 5*l.* to eight. The expense of pulling and carting is doubtless heavy; but, in strong lands, and where much wet falls, I conceive it impossible to attempt eating them off the ground with advantage:

advantage: even where there is a pasture adjoining for the sheep to lie, the constant passing through the mire injures them so much as to prevent their fattening; at least I have found it so after many trials; but I speak of mountain sheep, having no experience of any other. The Swedish turnips were very good. The kohlrabi got to about five pounds each; the white were the largest, the purple the hardiest. Cattle and sheep are particularly fond of them; but I see no advantage they have over the Swedish, except that they may be got at in frost. The cole-seed was delayed sowing from the wet; and very cold weather succeeding, prevented its making much progress. It may advance in spring, but to those who want it sooner, it is a failing crop. My stock consists of 22 heifers, 8 cows, which were in milk during summer, and give but little milk in October, 4 spring calvers, 10 head of young cattle, and 3 bulls, and 4 fattening; total shedded 51; 50 Highland heifers, and 150 sheep; part of the Highland heifers and sheep I have disposed of, which reduced my stock, at the commencement of the year, to 40 Highlanders, and 120 sheep.

The cows were not in general milk till the beginning of November, when the milk obtained exceeded 50 gallons per day; 30 and upwards in the morning, and 20 in the evening. 160 quarts of new milk, and 40 of skimmed, were regularly sold to the town, and required less than two hours to dispose of it at each part of the day.

The plan of feeding was considerably varied from the former year. Immediately after morning's milking

a stone

a stone of steamed chaff, which had been prepared the night before, and was become sufficiently cold, was given to each cow. After this followed three pounds of oil-cake. They were then turned out to water; on returning to their sheds, they had green food. Previous to evening's milking, a second feed of chaff, and after it a further feed of green food, and at 6 o'clock a foddering of 6 or 8lb. of straw.

Calculation of expense.—In estimating the cost of feeding, I shall take the whole at 6*d.* per day.

<i>Stone.</i>	<i>lb.</i>		<i>d.</i>
2	0	Of green food	0 $\frac{1}{2}$
2	0	Of chaff, &c.	2
0	3	Of oil-cake	3
0	8	Of straw	1
<hr/>			<hr/>
4	11		6 $\frac{1}{2}$
<hr/>			<hr/>

Cows which gave but little milk, and had no prospect of being improved :

	<i>d.</i>
3 Stone of green food	0 $\frac{3}{4}$
2 Stone of chaff	2
Straw, 8lb.	1
	<hr/>
	3 $\frac{3}{4}$

As soon as I can accomplish bruising the oil-cake, I expect a pound and half, or two pounds at most, will be

be amply sufficient, which will reduce the expense to 5d. per day. Upon an average I had, in milk, about 28 cows. They gave, with the exception of those which had been in milk during the summer) above eight quarts, wine measure, per day. The state of the atmosphere produced a very considerable alteration in their milking. I have known it vary two gallons a meal. I estimate the profit which might fairly be expected from each cow, as follows :

	£	s.	d.		£	s.	d.
				8 quarts of milk for			
				220 days at 2d per			
220 days at 6d.	5	10	0	quart -	14	13	4
Attendance -	2	0	0	33 carts of manure	1	13	0
Loss, risk, &c.	3	0	0	Calf -	2	0	0
	<u>10</u>	<u>10</u>	<u>0</u>		<u>18</u>	<u>6</u>	<u>4</u>
				Cost	10	10	0
				Clear gain	<u>7</u>	<u>16</u>	<u>4</u>

Supposing that, instead of heifers, the dairy was stocked with cows of the second and third calf, and the expense of keeping were estimated at sixpence each, I think ten wine quarts might reasonably be expected for 220 days, at the two meals.

	£	s.	d.		£	s.	d.
				10 quarts of milk for			
				220 days	17	12	0
220 days' feeding	5	10	0	Manure -	1	13	0
Attendance -	2	0	0	Calf -	2	0	0
Risk and expense, say	4	0	0		<u>21</u>	<u>5</u>	<u>0</u>
	<u>11</u>	<u>10</u>	<u>0</u>	Expense	11	10	0
				Clear gain	<u>9</u>	<u>15</u>	<u>0</u>

I conceive

I conceive this profit not to be over-estimated, but such as may fairly be looked for. The quantity of straw consumed for fodder, &c has so far exhausted my stock, as to oblige me to adopt expedients for bedding both cattle and horses. The substitute I have had recourse to is sea sand, which I can obtain within a mile: I use it so as to absorb all the urine, and expect it will be a very valuable manure for strong ground. I scatter a thin covering of straw over it for horses.

The expense of steaming chaff for a week, is as follows:

A woman, who attends the fires and sells the milk, at 12d, per day, supposing her labour to be divided between the two	s. d.
Half a hundred weight of coals per day, 3d.	3 6
	1 9
Expenses	5 3
100 stone per day, 1d. per stone	8 4
Clear gain	3 1

I have obtained an account of an experiment made last year by a very accurate friend of mine, of the feeding of four milch cows for 20½ days, where hay in part was given:

F 2

896 stone

896 stone of hay consumed by the four milch cows in	£	s.	d.
in 240 days, cost, at 6d. per stone	22	8	0
10 Winchester bushels of ground oats, at 4s.	2	0	0
64 bushels of bran, at 13d.	3	6	8
48 stone of carrots, at 6d. per stone	1	4	0
Half an acre of cole-seed	2	10	0
Attendance	8	0	0
	<hr/>		
By milk &c. sold	54	8	
Manure	5	0	
Four Calves	8	0	
	<hr/>		
	£	67	8
	<hr/>		
Profit by milch cows	27	19	5
Risk and depreciation in value			
3l. per head	12	0	0
	<hr/>		
Clear gain	£	15	19 5

This gives a profit, within a fraction, of 4*l* each. Each cow appears to have given eight quarts of milk per day, wine measure.

Cost of feeding, without attendance, is 9¼*d*. per day.

The quantity of food given to each beast, was :

	Stone.	lb.
Hay	1	6
Green food	2	0
Ground oats	0	4
	<hr/>	
	3	10
	<hr/>	

Experiments in making of Butter* from the above
Milch Cows:

48½ quarts wine measure, taken from the pro-

duce,

* I have found from experience, that all disagreeable taste in
cream

On supplying Milk for the Poor.

69

duce of the whole milk, yielded 3 lb. 1 oz.	s.	d.
of butter, which at 12 <i>d.</i> per lb.	3	1
42 $\frac{1}{4}$ quarts of blown milk, 1 <i>d.</i> per quart	3	6 $\frac{1}{4}$
4 quarts of butter-milk, 1 <i>d.</i> ditto	0	4
	<hr/>	
	6	11 $\frac{1}{4}$
48 $\frac{1}{2}$ quarts new milk, 2 <i>d.</i> per quart	8	1
	<hr/>	
Loss by butter, at 12 <i>d.</i> per lb.	1	1 $\frac{3}{4}$

By this experiment, nearly 16 quarts of milk were required to a pound of butter.

The Agricultural Report for Lancashire gives 18 quarts as the average quantity of milk for making a pound of butter from the hand-churn, and 15 with the horse.

The following experiments were made under the immediate inspection of my bailiff, as I was doubtful of the accuracy of my own dairy, which stated a pound of butter to eight quarts of strippings: to re-

cream and butter, from feeding milch cows on green food, is prevented by adopting the following method:

To every milk vessel, containing from six to eight quarts, put, on setting the milk, two teaspoonfuls of solution of saltpetre.

The manner I take to prepare it is as follows:

Dissolve, in warm water, as much saltpetre as it will contain, then boil it on a slow fire, till all the scum, which rises to the surface, be taken from it. When cool, strain it into bottles for use. Then of this mixture about 2 teaspoonfuls are to be added to 6 quarts of milk.

concile so great a difference, the large proportion of heifer's milk, which is much richer than cows of the second or third calf, must be allowed as contributing something. The oil-cake, I have no doubt, is the principal cause of the surprising difference. The butter was made with a pendulum churn of Mr. M'Dougall's, which answers admirably well, and saves much labour.

48 quarts 3 pints of strippings, gave of butter	s.	d.
6 lb. at 12d.	6	0
38 quarts of blown milk, 1d.	3	2
7 quarts of butter milk, 1d.	0	7
	9	9
<hr/>		
48 quarts and 3 pints of new milk, at 2d. per quart	8	3
<hr/>		
Gain by butter	1	6
<hr/>		

48 Quarts 3 Pints of a Mixture of Milk.

48 quarts 3 pints yielded 5 lb. 3 oz. of butter,	s.	d.
at 12d.	5	2
36 quarts of blown milk	3	0
10 quarts of butter-milk, 1d.	0	10
	9	0
<hr/>		
48 quarts and 3 pints new milk	8	3
<hr/>		
Which leaves a profit by butter of	0	9
<hr/>		

The

The advantage of oil-cake, in the making of butter appears very considerable. Eight quarts of strippings give a pound of butter ; and nine and a half of a mixture of the whole milk. In the transactions of the Bath Society, Vol. IV , I see that 12 lb. are stated to give a pound of butter. Wine measure is used in all the experiments.

I have thus, with the most exact attention to accuracy in my power, endeavoured to detail the experiments I have made in the last two years. The individual benefit reaped from it will be most satisfactorily proved by the annexed certificates, which had the signatures of above five hundred persons, stating the advantages derived from the sale of the milk, and certifying also for its goodness. The numerous signatures bear ample testimony to its utility ; and indeed when it is considered that butcher's meat is at 6*d.* per pound, and that good and nutritious milk can be obtained at 1*d.* per pound, (less than a third of the price of bread) its advantages cannot be doubted. The health and condition of the cattle are certified for by all the farmers in the neighbourhood, and will, I am confident, be agreed to by all who have seen them.

I rejoice sincerely at the appearance of profit of the present year : it answers my most sanguine expectations, and confirms the opinion I formerly entertained, not only of the practicability of furnishing a plentiful supply of milk during winter, but also with a profit not unworthy the attention of any farmer. I trust that what I have done may stimulate others, and that the result of their trials will be equally successful with

72. *On supplying Milk for the Poor.*

those I have instituted, and prove a great acquisition of comfort to the lower orders.

The following estimate of expense and profit will rather fall short, than exceed, what may fairly be expected. In this I am confirmed by the opinion of those who were employed in conducting the experiment.

Value of Green Crop in 1805, Oil-cake, and Attendance :

	£	s.
33 acres of green crop at 5/ per acre	165	0
10 tons of oil-cake, at 10/ per ton	100	0
Attendance	145	0
Chaff and straw	50	0
<hr/>		
Total expenses of green crop, oil-cake, &c.	460	0
To which may be added, for risk, capital, &c.	108	0
<hr/>		
	£ 568	0
<hr/>		

Expense of keeping Milch Cows for 220 Days; for which period the *Green Crop* is calculated to last :

30 milch cows for 220 days, at 6d.* per day each	£	s.
	165	0
<hr/>		
Carry forward	165	0

* 6d. is charged, but some had no oil-cake, and cost only 3½ per day.

Brought

On supplying Milk for the Poor.

73

	s.
Brought forward	165 0
Attendance	60 0
Risk, &c. &c.	90 0
	<hr/>
	315 0
	<hr/>

The Produce of Milk, &c.

	£	s.
By 180 quarts of milk for 220 days	330	0
By calves sold	50	0
1000 carts of manure from the proportion of sand, valued at 1s.	50	0
	<hr/>	
	430	0
Expense of feeding, &c.	315	0
	<hr/>	
Clear profit	115	0
	<hr/>	

The average quantity of milk from each cow, is 6 quarts; this is owing to the summer calvers, which are included in the stock: 8 quarts may be estimated on a moderate computation; this would have added 5s. per day, or 55l. upon the whole period. A well selected dairy might reach 10 quarts, which would make an addition of 100l. The next year I expect to have a better set, and do not fear making 200l. by the same number. November is as early as a winter dairy should begin; till that period milk can be had from pasture, and it is neither of the same service nor value at a later period.

Profit

74 *On supplying Milk for the Poor.*

Profit upon remaining Stock :

	£	s.
50 Highlanders, at 4 <i>l.</i> each	200	0
17 young cattle and others, valued at 6 <i>l.</i> each	102	0
150 sheep, at 10 <i>s.</i> each	75	0
4 Cows, fattening, at 12 <i>l.</i> 10 <i>s.</i> each	50	0
600 carts of manure, at 1 <i>s.</i>	0	0
	<hr/>	
	457	0
Expense of feeding, &c.	253	0
	<hr/>	
Profit	204	0
	<hr/>	

	£	s.
Profit by milk	115	0
By stock	204	0
	<hr/>	
Total	319	0
	<hr/>	

There were sold, by the last day of January, 22,000 quarts and upwards of new milk, which averages 183 quarts per day ; in the last month, upwards of 200 quarts per day, and this may continue without much diminution for six weeks. I do expect the quantity of milk will exceed the estimate. Something, however, depends upon the state of the weather. I weighed some of the kohlrabi: I had white that weighed seven pounds and a half, with little

the or no top ; and the purple five and a half. I think they would average five pounds.

I have now fulfilled, to the best of my power, the different statements connected with the experiment, and trust in the indulgence of your Lordship and the Board for any unintentional errors I may have committed. By delaying another year I might have made great improvements in my plan of feeding, and have produced a more flattering result. I am unwilling, however, to delay the communication. The profit is sufficient to encourage others, better qualified than I can pretend to be to prosecute the plan from which so much benefit will accrue to the public at large.

I remain, &c &c.

THREE months have now elapsed since I had the honour of submitting to the Board a detailed account of my experiments in the feeding of milch cows, and as the period of 220 days, upon which the calculation was found, is also completed, I beg leave to add the subsequent proceedings, and the improvements in some particulars, which I have been able to effect. Having erected an apparatus for grinding of oil-cake, I have been enabled, for the last two months, to make a saving of one pound per day, in the feeding of each milch cow ; and I find, that, when ground and boiled with chaff, it has been more productive, and increased the quantity of milk.

The expense is now reduced to 5½*d.* per day for each cow.

Two

	<i>d.</i>
Two stone of green food -	0½
Two stone of chaff boiled -	2
Two pounds of oil-cake -	2
From six to eight pounds of straw	1
	<hr/>
	5½
	<hr/>

The quantity of milk up to the 20th of April, when eleven of the worst of the cows were sold, exceeded 180 quarts per day, which was beyond my expectation.

Forty thousand quarts and upwards of new milk have been sold up to the 1st of May.

	<i>£.</i>	<i>s.</i>
The actual receipt for milk amounts to		
somewhat above - -	360	0
Calves - - -	54	0
Manure, much undervalued, at 1s. 6d.	50	0
	<hr/>	
	464	0
	<hr/>	

	<i>£.</i>	<i>s.</i>
The expense, at the present actual cost of		
5½ <i>d.</i> per head, on 30 milch cows, for		
220 days, will amount to -	151	0
Attendance - - -	60	0
	<hr/>	
Carry forward	£ 211	0
		Brought

	Brought forward	£ 211 0
Loss upon 11 of the worst cows already		
sold, at 2 <i>l.</i> 10 <i>s.</i> each	-	27 10
Probable loss on the remaining 19 cows,		
estimated at 2 <i>l.</i> each	-	38 0
		<hr/>
		276 10
		<hr/>

Which leaves a balance of profit (on the supposition of the present expense of feeding) of 187*l.* 10*s.* or 6*l.* per head on each milch cow.

On beginning to feed with cole-seed, I found an almost immediate increase in the quantity of milk, and I cannot too strongly recommend it, as well for this object, as for its superiority over all other green crops in point of duration. What I sowed in August is still in use, and will, I confidently expect, serve through the whole of this present month.

The milk sold from 19 cows in the last two fortnights, ending the last week in May, amounted, in the first fortnight, to 21*l.* 3*s.* 8*d.*; in the second to 21*l.* 10*d.*, or 181 quarts per day; and a considerable profit will still accrue before they will be entirely deprived of their milk.

The enlightened and humane attention of the Board has been directed, in an especial manner, to encourage the appropriation of small allotments of ground to cottagers, for the purpose of enabling them to keep a cow; yet, great as this benefit undoubtedly is, how small is the number that can profit by it, when compared with the lower class of inhabitants in towns!

and

and I humbly conceive, that it is in the power of those who hold large farms to sell new milk, with a large profit to themselves, on cheaper terms than the cottager can procure it, especially during the winter months.

I cannot too earnestly call the attention of landed proprietors to the advantages that would result from their requiring their farmers to supply a certain quantity of milk at a fair price for the support of the poor in their respective vicinities; at all events, of those families who are employed in the cultivation of their own farms. And though the resulting profit may be of comparatively small importance in the scale of their annual gains, yet, as an act of benevolence, an attention to the interest of the most valuable class of men, it is an object highly worthy of consideration. Nor is its importance limited solely to the preservation of lives of a number of children, and the increase of comforts to the labouring classes of society. Compared with the other prime necessities of life, milk is not only the most nutritious, but the cheapest article of subsistence, that can be produced for the support of man. To prove this fact, we will compare its price with that of bread, and then with the average cost of butcher's meat. And, first, it appears, that bread, which is now at 3*d.* per pound, has not been sold lower than 2½*d.* during any part of the winter; whereas milk at 2*d.* per quart, or 1*d.* per pound, is exactly one-third the price of bread. Compared with butcher's meat, it is one-sixth; and as a beverage and substitute for malt liquor, I conceive it to be a fourth; and

and it is certainly better adapted to the labourer than any other liquor, from its being of a slower digestion.

Viewing it as it concerns the public, milk affords the largest supply of victual from the least consumption of food. A great proportion of food, which is so admirably adapted for producing milk, is not applicable to the feeding of fat cattle.

I conceive that the food necessary for a cow in full milking will not exceed one-third of what is requisite in feeding for the butcher, but it is in weight as 3 to 1 ; but allowing the difference in the quantity of food to be less than what I have taken it at, a milch cow, nine months or 270 days in milk, at 10 quarts in the two meals, would give 2700 quarts, or 5400 pounds weight of milk. Were the same animal fattened to 30 stone (of 8lb. per stone) a quarter, with an allowance of five quarters for the carcase and fat, the whole weight would be only 1200 pounds ; and would be to milk only in the proportion of 1 to 4.

Supposing the average produce of each acre of wheat to be 24 Winchester bushels, at 60lb. per bushel ; the actual nourishment derived from one bushel will be 37lb. of first flour and 14 of two inferior sorts, 8½lb. of bran, allowing half a pound for waste, making in the whole 60lb. or 1224lb. of flour per acre ; so that it would require four acres to give the weight of flour equal to the weight of milk given by a single cow in 9 months.*

The

* To shew the gain of victual on the public, when compared with bread, the article of first necessity, we will state the total product

The advantages of a supply of milk for the use of the lower orders is great in every point of view ; and I trust the discussion of the subject, and the bringing of it before the public, may be the true means of extending the benefits which I have had the satisfaction, for these two years past of introducing among the poor of my own neighbourhood.

May 25, 1806.

P. S. By advertizing to the quantity of milk given in the month of May, with only 19 milch cows, it will clearly appear how much greater the profit would have been upon a well selected stock.

The total amount of milk sold in London, was some years ago estimated at a million per annum, which at 4*d.* per quart gives a consumption of sixty millions of quarts, allowing a million of inhabitants to London and its environs ; the daily proportion to each person will be one sixth of a quart, at an annual cost to each person of 20*s.* The town of Kendal, as far as I have been able to learn, 'on comparison with other places,

product of milk up to the last week in May, when the 30 cows had yielded forty-five thousand quarts of milk, equal in weight to ninety thousand pounds. The green food consumed, (oil-cake and chaff not taken into the calculation), supposing twenty tons to be the average of green crop per acre, would be less than four acres, but say five. Twelve hundred and twenty-four pounds being the product of an acre of wheat when made into bread. It would require seventy three acres of wheat to yield ninety thousand pounds of bread. Thus sixty-eight acres are gained for other purposes upon a comparative scale between the product of milk and bread.

is

is the most abundantly supplied with milk of any town in the kingdom. It appears from very accurate enquiries of my friend Dr. Campbell, that the daily sale of milk in the town of Kendal is equivalent to a pint to each person.—This information led me to institute similar enquiries in the principal towns in this county: the returns I have obtained, though most probably not perfectly accurate, are yet sufficiently so to shew the abundant room there is for an increase of this most valuable article: the following statement will exhibit the sale and cost of milk at the various places.

Price sold	Population.	Cost of	Daily proportion to each individual.	Yearly consumption of each person.	Expense.
		£			£. s. d.
London, 4d. per qt.	1,000,000	1,000,000	1-6th	60 qts	1 0 0
Kendal, 2d. -	7500	11375	1-half	181½	1 10 4
Workington, 1805 2d. -	8000	2701	1-9th	40½	6 9
Workington, 1807.	the hamlets are included in population.	3694	1-6th	53	3 10
Whitehaven, 2d.	14000	3500	1-12th	30	5 2
Carlisle, 2d. -	14000	3650	1-10th	36½	6 1
Penrith, 2d. -	5000	1890	1 8th	44	7 6
Brampton, 2d.	2000	865	1-7th	51	8 6
Longtown, 2d.	1200	940	1-4th	91	15 0
Wigton, 2d. -	3000	760	1-12th	30	5 7
Bury St. Edmonds, 2d. -	7000	2804		485	8 1½

In the present year an advance of 1*d.* per quart has taken place, this will be a tax of two hundred and fifty thousand pounds per annum upon the inhabitants of London. As the former price precluded the use of milk as a necessary of life amongst the lower orders, less regret is felt at its advance. The stoppage of the distilleries has added most considerably, without doubt, to the expense of feeding milch cows: the advance being once made, it is not likely it will ever be taken off.

Milk being paid for in London as a luxury, produces a supply far above the average of most provincial towns. This is the result of the numberless opulent inhabitants, and the extensive luxury of the place. Milk is used in London principally as a luxury, it forms no part of the necessaries of life to the mass of the people.

The milkman gets 3*d.* per quart, the other penny goes to the venders. The quality of the Milk is naturally poor admitting it to be sold as received, without any adulteration.

A fourth part of the Kendal supply is of skimmed milk, which reduces the sum paid for milk to 800*l.* per annum. What proportion skimmed milk may bear in the sales of other towns, I cannot pretend to say, but in no proportion to Kendal, in the neighbourhood of which there is much butter and cheese made.

The daily sale of milk at Workington (where the population, including the villages immediately connected

nected with it, amounts to eight thousand), within the last three years had been increased one-fourth, or 1*s.* 5*d.* per head, the proportion being 1-12th, and now 1-9th. Since writing the above, I have made a fresh enquiry into the quantity sold, it being two years since the former account was taken.

What led to this, was my finding, that with a larger supply of milk, my milk-cart did not reach within a quarter of a mile of where it formerly used to do. The result has afforded me the highest gratification; it has proved that the sale is increased a third, and that the proportion is now a quart to six persons, with an increase of 2*s.* 1*d.* per head. Thus the sale has been doubled in four years; notwithstanding which, it is the opinion of all the dealers, they could dispose of a still greater quantity. On the first introduction of my milk, great opposition was made by those in possession of the trade, under the very mistaken idea, that it would interfere with and materially diminish their sale.

The opinion I then entertained on this subject has been fully confirmed by the event, and the application may prove equally useful to every other populous town in the kingdom. Milk, which, under the stinted supply, was considered as an article of luxury, is now become a necessary part of daily subsistence, and reckoned upon as such by a great number of families, who previously never made use of it. And what may be an encouragement to others to attempt the same thing elsewhere, the increased supply has not kept place with the increasing demand. I cannot but

flatter myself the preceding statement may serve as a sufficient example, not only to draw the attention of the public to the subject, but to induce other agriculturists to institute similar enquiries in their own neighbourhoods, and to encourage the adoption of measures for supplying milk.

There are two other modes of applying the produce of a dairy. The first and most general is that of making cheese and butter. I was in hopes I should have been furnished with such information on this head, as would have enabled me to have stated something on the subject, but the accounts I have received are so various, that I feel myself obliged to decline it. The other method is what relates more particularly to the metropolis, I mean fattening of calves; the same reason which prevented my going into the former details, are still stronger on a subject of which I know nothing. I prefer professing ignorance to offering opinions not warranted by my own experience, or that of others on which reliance can be placed.

The happy effects of a milk diet are strongly exemplified in the remarkable instances of longevity to be met with at Kendal, and not less so in the great disproportion of deaths of children under seven years of age, contrasted with other towns of equal population. I had great hopes I should have been able to have ascertained what were the necessaries of life, which had been exchanged for milk; but in this expectation I have been disappointed. In the last twelve months, or little more, the sale of milk has increased 900% per annum; the advantage to the individual must be great

great, as well as to the public, by the use of a victual which is produced with much less consumption of food than any other. After much investigation by others, in aid of my own enquiries, I have been obliged to relinquish my design of drawing a comparison of the present and former state of the labouring community; but I think it can admit of no doubt (could I have procured the facts I sought for), that the result would have clearly and satisfactorily demonstrated, that milk is not the only object of the first comfort to the lower orders, but likewise the cheapest, most palatable, and nutritious, and salubrious food they can have. And considering how much greater a proportion of nourishment is produced from milk, than in any other mode in which the earth can be employed, it is not unworthy of serious attention in a public view. The following statements were sent me by a gentleman who has paid particular attention to bettering the situation of the lower classes of the community.

A calculation of Expense of the Breakfast of Six Persons on Milk and Tea.

	s. d.		s. d.
$\frac{3}{4}$ oz. of tea	0 4 $\frac{1}{2}$	4 quarts of milk	0 8
6 oz. lump sugar	0 6	1lb of oatmeal	0 2 $\frac{1}{2}$
$\frac{1}{2}$ lb. butter	0 6	1 $\frac{1}{2}$ lb. wheaten bread	0 4 $\frac{1}{2}$
2 $\frac{1}{2}$ lb. of bread	0 7 $\frac{1}{2}$		<hr/>
Milk	0 2		1 3
	<hr/>		<hr/>
	2 2		Saving. 0 11

The following important information was published in the ANTI-JACOBIN REVIEW for the month

month of January, 1809 ; it is highly deserving attention, and as such, I take the liberty of recommending it most strenuously.

In recommending, however, the reforms proposed by Mr. Curwen, in the economy of food for man and beast, let it not be supposed that these are all the improvements which could be instantly and conveniently made: there is yet another much greater and more simple, which should be adopted in the manufacture of bread. The French, who are not only the greatest epicures, but also the greatest gormands, have had recourse to artificial means to ferment their bread, in order to render it more soluble in their soups and other liquids ; we have imitated them in this respect without having the same necessity, and ferment our bread to such an excess as to lose the most essential part of it. From a great variety of experiments on flour of different countries, we have found that a pound of good flour generally contains

oz. 14	amylaceous matter,
1	gluten, or vegeto-animal substance,
$0\frac{1}{4}$	sugar,
$0\frac{3}{4}$	insoluble fecula,
<hr/>	
16	ounces.

“Now in the process of fermentation, both gluten and sugar are destroyed, which are the two most nutritious parts of the flour. Supposing, then, that each individual in London consumes a loaf of fermented bread every week, which is considerably under the average

average, and that every loaf loses by fermentation five ounces, or only a quarter of a pound, the annual loss of nutritious matter in the bread of each person would be 26lb. or six weeks' allowance. If the population of London be taken at the lowest calculation of one million, thus at least twenty-six millions of pounds of this vegeto-animal substance is annually lost. As this loss is of the most nutritious matter, it is equal to three and one-quarter millions stones of meat, worth 600,000*l.* allowing that each individual in London annually consumes 245lb. of meat; and if it is estimated according to the system of Pringle, that one pound of animal food contains as much nutriment as twelve pounds of vegetable, it is equal to the annual loss of three hundred and twelve million pounds of bread. Comparing, however, bread to meat as four to one, which is pretty near the fact, almost one-fourth of the nutriment of flour is lost by fermentation. This is no visionary speculation founded on any abstract theory, as we have physical demonstration of the advantages of unfermented bread in the superior health and strength of our seamen, who are for years accustomed to nothing but hard dry biscuit. These facts show what very simple means are yet within our power to increase the quantity of food for our increasing population, without having recourse to the anti-social plans of Malthus. Abandon the use of fermented bread, and the same quantity of flour now consumed will support equally well at least one-ninth more than the present population. The loss of bread by fermentation will also enable our author to ex-

plain more satisfactorily why two and one-half acres of land formerly were amply sufficient for the support of a labourer, when five and one-half will barely suffice to furnish him at the present day with the various articles of food and liquor. When luxury and affected delicacy were less general, when the use of fermented bread was confined to the large towns, and only to the higher classes in those towns, and when the greater part of the wheat appropriated to bread was ground only into meal, which was mixed with that of peas, beans, or barley, and used by all the working people in solid bread, without being deprived of its sugar and gluten, then indeed might a much less quantity of land furnish nutriment for each individual. The accumulated population of great towns, the increase of large manufactories, and the almost universal use of animal food, may have contributed, as Mr. C. concludes, to increase the consumption in a greater proportion than the population has increased; but the augmented and still augmenting waste of bread-corn, is the most serious and efficient evil in the economy of aliment. There is scarcely a day-labourer or plough-boy in England who does not now eat his *wheaten loaf* and tea for his breakfast, to the great injury of his own health and strength, and the prejudice of his family."

I have long wished to see premiums offered in large towns for the greatest quantity of good milk publicly sold, according to the size of the farm, and the distance brought. Viewing it only through the narrow medium of the saving which might be made in the
poor-

poor-rates, the general adoption of some plan to encourage a supply, would be a wise and a humane measure. Few I trust, if any, are insensible to the more honourable sentiment of "*Homo sum.*" To preserve health, to promote the comforts of the labouring classes of society, and to save numbers from an untimely grave, are objects of interest to the man, to the parent, and to the politician*. Of those I have consulted, as to the articles they had given up, for the purchase of milk, I found no single person, not even the poorest who was not thoroughly convinced of the benefit and advantage derived from this salubrious diet. But their earnings had not been expended on any scale of estimate, necessity too often compelling deprivations, not within the contemplation of those whose fortunate lot has placed them in affluence. It might not, I conceive, be unprofitable to teach youth, as a part of education, that branch of political arithmetic, by which the means of subsisting any given number in a family at the lowest given rate, is estimated and explained; not only with a view of impressing upon them the blessings of affluence, but enforcing at the same time the just claims of humanity and consideration for those whose laborious exertions

* Several tracts published by the late much-lamented Dr. Beddoes clearly demonstrate the injury done to the health of hard-working people by the use of fermented liquors. He strongly points out the advantages of milk, and recommends it above all other beverages diluted with water. By his death philanthropy has lost one of its brightest ornaments—the labouring classes one of their ablest and warmest friends.

furnish the necessaries of life. Ignorance more frequently, than any want of feeling, prevents our justly attending to their wants and deprivations. The calculations of profit on the sale of milk are made on land, the rents of which are from forty shillings to 3*l.* per annum, which is a fair average at two miles distance from any great town in the kingdom. In few instances will they be found to exceed it. If good milk could be obtained, it would, I believe, be frequently substituted in the place of other pernicious beverages. An instance of this I have lately learnt from Mr. Faulder, who was formerly the farmer at Colgarth Park, in Westmoreland, and is now settled at Eltham, in Kent, on a good milk farm. The produce was, for some years, carried a distance of eight miles, and disposed of in Oxford-street; but a nearer market opening to him at Woolwich, he wisely availed himself of it. And amongst his customers are the men employed in one of the great iron works carried on at that place. A single individual has prevailed upon his companions to make the experiment of milk as a substitute for porter. The result has proved it to be the best means of quenching the violence of thirst, and securing them from the feverish heat produced by the immoderate use of fermented liquors. They have persevered in this simple and wholesome beverage, with an evident benefit to their health, and with an increased ability of exertion. May their example be recommended, and holden forth as a pattern of imitation by all whose situation in life, and extensive concerns, enable them to influence and determine the
moral

moral conduct of large numbers of the industrious class of the community.

PROCEEDINGS OF 1806 AND 1807.

It would not be consonant with the frankness with which I have endeavoured on all occasions to deliver my opinions, were I to disguise the extreme satisfaction I feel in submitting to the public eye the details of my dairy for a third year. It was very distant from my thoughts, to suppose any farther account would have been called for: The Board of Agriculture having withdrawn their premium, I should not have felt it incumbent upon me to offer any further observations on the subject. The wish for the republication of this Essay, however, in a form which may extend its circulation, argues, I trust, that the object of supplying milk to the labouring classes, has engrossed some portion of public attention; and I am willing to flatter myself it may, in some small degree, be instrumental in extending to other places the advantages I have seen derived from it within the confined circle of my own immediate observation.

In the commencement of this experiment, I had to contend with difficulties which all must experience who engage in things they do not understand. I had neither knowledge to detect what was wrong, nor to prevent many errors being committed. Time and attention have enabled me to acquire some insight into the subject; and that I have done so, will best be

be proved from the increased profits of the present year. I am inclined to believe, under complete good management, still further profits are to be made. It was my intention, as soon as I found my example had stimulated the farmers near me to turn their thoughts to supplying the town, to have relinquished my dairy. This, however, I found, for the present, I could not do without a manifest injury to those whom I was anxious to serve. Notwithstanding the great increase of milk, the demand exceeds the supply; and in all probability, I shall, previous to October next, which is the conclusion of the year's account, dispose of a hundred thousand quarts, to an amount of 833*l.* or nearly a third more than the former year.

DAIRY ACCOUNT.

Milk sold from October, 1806, to Oc-

tober, 1807, 68,844 quarts, at 2*d.* £ 573 14 0

500 carts of Manure, at 2*s.* 6*d.* - 100 0 0

Calves sold—I was unfortunate in los-

ing a great many - - 22 5 6

3 do. reared at 10*l.* each* - 30 0

Carry forward ————— 725 19 6

* I was tempted to try a method reported to have answered, of feeding calves with a solution of molasses, or brown sugar. I embarked in this experiment the more readily, as every calf I reared for the butcher consumed on an average in a month two gallons of new milk, and seldom selling for more than 30*s.* at that age. In this project there was every thing to gain, and nothing to lose. After a variety of trials, not one of which ever produced the most distant hope of fattening, and to which numbers of calves fell victims, I renounced the plan, and till I have better authority

EXPENSES

On supplying Milk for the Poor. 93

Brought forward - £ 725 19 6

EXPENSES OF DAIRY.

To keep of 25 milch cows, at 6d. per	£	s.	d.
day, - - - - -	228	2	0
2 men constantly employed, at 10s.			
per week - - - - -	53	12	6
Additional help in milking, &c. -	15	0	0
A boy and horse - - - - -	73	0	0
Supposed decrease in value, 3l. per head	75	0	0
	<hr/>		
		444	14 6
	<hr/>		
Balance to clear gain -	291	5	0
	<hr/>		

The average of profit will be 11l. 5s. per head on each milch cow.

I am suffering at present from the want of oil-cake, which contributes beyond all other things to increase the quantity, and improve the quality. 184 Wine quarts of milk, when the milch cows are fed with oil-cake, will yield 23lb. of butter, of 16oz. to the pound. Without it, though each cow is allowed 3lb. of refuse barley ground and boiled in their drinks, it will only produce 21lb. With oil-cake, 8 wine quarts produce a pound. Without it, very nearly 9 quarts are required. The value of the food is much the same. The average green crops of this year will exceed 37 tons; which, at a farthing per

than any I have yet met with, shall rest satisfied that it will not answer. For rearing calves for stock it may do, but the chance of killing is so great, as to make even this dubious.

stone,

stone, pays 6*l.* 3*s.* 4*d.* The tops of carrots (of which I had 22 acres) are very good feeding, if not given in too large quantities. The steaming of chaff is carried on, and was begun earlier this season, which has been found an advantage. More manure might be made, could I spare straw; but so great is my consumption for food and cutting, that I can afford very little for litter, and am obliged to continue the bedding with sand, even through the winter, notwithstanding I had 12,589 stooks, or shocks of corn, and purchase all the straw that is to be sold.

By a communication which I have at length obtained from the breweries, I find a great diminution in the quantities of small beer brewed since the year 1803. I always conceived this to have been one of the articles for which milk was substituted. Malt liquor is in general so deteriorated in quality, and especially small beer, that happy is it for those who can obtain any other wholesome beverage. The inhabitants of the northern counties possess some advantages over those of the south, and in none more than in their taste for potatoes. To give some idea of the consumption, I have caused particular attention to be paid, in order to ascertain the quantity sold for nine months in the year: In Workington, on an average, sixty cart-load are disposed of per week, of fifty stone each, which, at 4*d.* per stone. amounts to 2000*l.* per ann.; and if we take the other three months at an average, (though the quantity will not be so much) the price of new potatoes being one-third more, it would make the value 2666*l.* or 6*s.* per head on the whole

whole population, and would require the produce of between eighty and ninety acres. Potatoes have this year risen to 6*d.* per stone, which makes an advance of 888*l.*, and in all probability would have been at 9*d.* and 1*s.*, but from the large quantity grown for my horses, which are now applied solely as food for man. Potatoes, with milk and bread, form an admirable diet for children. The most important of all the acquirements obtained from a knowledge of the new world, are potatoes; and the comfort and benefit of them is daily extending, as well in this as in every other country. In Flanders, thirty years ago, the very poorest of the people would not eat potatoes. Being resident in a large town in that country for some time, I desired potatoes to form a part of every meal; finding my orders constantly disobeyed, I was led to enquire how it happened; the cook who supplied my table, insisted they were always sent; on a further investigation, it was found the good lady of the house constantly intercepted them, insisting they were not food for "*un homme comme il faut,*" and I lost all consequence and respect in her opinion, from my perseverance in insisting upon having them, in future, served at table.

September 24th, 1807.

FROM a mixture of the whole of the milk of three cows, fed with part clover and part fog, or after grass, 70 ale quarts of milk produced 107 ounces of butter,
the

the cream *from a lead*. The trial I made a former year was, I believe, 16 ale quarts of milk to 16 ounces of butter nearly, the cream being produced in the vessels of *common earthen ware*.

It may be necessary to observe that these trials were from two of the same cows, and one different.

W. SWINBURNE.

To J. C. CURWEN, Esq.
Workington Hall.

This is nearly 11 quarts of milk to one pound of butter.

Workington Hall Mills, Nov. 13, 1807.

SIR,

At your request, I have this day examined my milk book, and find that the two winter cows, for four months, averaged $14\frac{1}{2}$ quarts of milk per day, from January to May; and that three summer ones averaged 16 quarts per diem from May to November, 6 months—from,

Sir,

Your most obedient servant,

THOMAS GAFF.

To J. C. CURWEN, Esq.
*President of the Workington
Agricultural Society.*

Keswick,

Keswick, 21st Sept. 1807.

SIR,

Agreeable to your request, I transmit an account of the expenditure of the clover, and the produce of the dairy; not having your queries in writing, I have been under the necessity of trusting to memory, but think I have not omitted any thing material. I was at first surprised to find the quantity of cream and blue milk conjointly exceeded the new milk itself; but, on repeating the experiment, I find this really is the fact, and in the proportion of about 18 to 17; but, as the union of the cream with the milk is a chemical, not a mechanical combination, should any one object to the accuracy of the experiments, that the parts are greater than the whole, I must appeal from the laws of mathematics to those of chemistry.

I am, Sir, with respect,

Your obedient servant,

JOHN BOWER.

To J. C. CURWEN, Esq.

Expenditure of 2½ Acres of Clover.

Cattle kept	{ Horse 1 Cows 6 }	-	-	7 head of cattle
Consumption per day	-	-	-	67 stone of clover
How frequently mown	-	-	-	3 times
		H		Duration

<i>Duration of each cutting.</i>	<i>Days.</i>
1. From May 29, to June 29,	32
2. From July 14, to July 28,	18
3. From Aug. 23, to Sept. 2, and from Sept. 10, to Sept. 18, -	20
	— 70 days

Weight of crop = $67 \times 70 = 4690$ stone 29.3125 ton.

Weight per acre $29.3125 \div 2.5 = 11.725$ ton

Exclusive of after-grass, which may be depastured on the ground; but I fear the early season at which the frosts have commenced, will prevent a fourth cutting, which I once expected.

One week's produce of five Cows, viz. from 11th to 17th September.*

New milk,	411
Strippings,	14
	— 425 quarts entire milk
Cream,	49
Strippings,	14
Blue milk,	393
	— 456 quarts entire milk

<i>Weight per quart.</i>	<i>lb.</i>	<i>oz.</i>
Cream	1	8½
Strippings	1	10½
New milk	1	10½
Blue milk	1	10
Produce of blue milk in curd, previous to pressure	63	0
Do. do. in cheese, on coming out of the press	51	8
Butter from cream and strippings	28	0
15 quarts appear to be taken to make a pound of butter.		

* The milk of the sixth, a winter calver, was reserved for the use of the family.

Workington,

Workington, Jan. 11th, 1808.

SIR,

It is with great pleasure I inform you of my observation on the benefits resulting from your plan of supplying this town with *genuine* new milk from your farm twice a day, particularly in the winter.

It is sensibly felt by those who have young families.

A few years since, in the winters, the supplies were so scanty, that interest was made with the seller to obtain a small quantity two or three times a week; the demands were so great, that they could only get it in rotation.

In consequence, the situation of the children of the lower order was miserable; their breakfasts consisted of tea, mixed barley-bread, made with leaven, perhaps the most improper food for them, sometimes oatmeal porridge, with a small quantity of molasses, butter being so dear that they could not obtain it.

Your abundant supply of the most proper aliment for them demands the utmost gratitude from the inhabitants in general, and with the utmost satisfaction I repeat the good effects I have remarked in the general health of the children in this town, where milk has been used in preference to other food. I do assure you this description is not meant in compliment, but from a conviction of the utility of your plan. I consider myself interested in the continuance of it, and hope it may be continued, not merely from emolu-

ment, but the general good of the town, which you have at all times considered.

I am, Sir,

Your most obedient humble servant,

W. DICKINSON.

I was gratified by the receipt of the preceding letter from the first medical gentleman of this town, which is the most convincing proof of the benefits derived from a supply of milk to the labouring community, and is a rich reward for any personal exertions.

STATEMENT OF PROCEEDINGS, 1808.

The following is an Abstract of the Fortnight's Sale at the Schopse, for three years.

Produce of Milk, from October, 1807, till October, 1808.

	<i>Qrts.</i>	
Sold to the Town	84464	
Milk given to calves	2500	
		<i>£ s. d.</i>
	86964 at 2d. per quart,	724 14 0
		<i>£ s. d.</i>
Calves sold for	40 1 0	
Three reared, at 5 gs. each	15 15 0	
	55 16 0	
Milk given to calves, 2500		
quarts, at 2d.	20 10 8	
Profit	34 19 4	34 19 4
		Total

On supplying Milk for the Poor. 101

	Total produce,	£. s. d.
		759 13 2
	£ s. d.	
Keep of 30 milch cows, for 12 months, at		
6 <i>l.</i> per day,	270 15 0	
Estimated loss on 30 cows, at 3 <i>l.</i> per head	90 0 0	
	<hr/>	360 15 0
	Clear profit	<hr/> 398 18 0 <hr/>

This gives a profit of 12*l.* 19*s.* per cow. If the manure should not be considered as equivalent for milking, &c. strike off the 19*s.* and say 12*l.*

I am led to believe the following statement of the progressive increase of the sale of milk, in the town of Workington, will be tolerably accurate :

Year.	Quarts.	£.
1805 -	222,755, at a cost of	1783.
1806 -	334,128, —————	2674.
1807 -	408,096, —————	3151.
1808 -	507,024, —————	4244.

The sale was formerly at the place of milking, or by a few individuals at their own houses, in the town; it is now sent round the streets in carts, by all the principal dealers, and disposed of with a facility that offers the strongest proof of an increasing demand. The profits are ample; and whilst those who are embarked in the trade have the wisdom to be satisfied with a price which gives to milk a preference over the other necessaries of life, the demand will continue, and most probably become still greater: but if, unfortunately for themselves and the public, the dealers should be induced to combine, and succeed in ad-

vancing the price of milk, the infallible consequence will be, that the demand will as rapidly decrease as it has advanced, and milk will become again an article of luxury, as it was a few years back. The farmer will be disappointed of his golden hopes, and the labouring classes deprived of a beverage, which has contributed so essentially to their general health and happiness.

No part of my farming affords me more satisfaction than my dairy. I daily witness the comfort it diffuses. The increased sale of milk is alone evidence sufficient to establish its utility. The profit is abundant, and might still be increased, by attending to the stock of which the dairy is composed. I have been gratified with the prospect of seeing the plan adopted in different parts of England. Lord Dundas has assured me of his intention of proceeding on the same system, at his great allum-works, in Yorkshire. I have also heard from that able friend to every measure which can better the situation of the poor, (I mean Dr. Beddoes) of his hopes and wishes to see it established in Bristol.

In concluding this subject, as it is not probable I shall ever again be called on to revise or add to my labours, I trust I may be excused if I express my ardent wish, that the earlier part of life had been devoted to the pursuits of agriculture. Without subjecting myself, I trust, to the imputation of arrogance, I may hope to have employed the leisure hours of the few last years, not altogether unprofitably to the public, or without advantage to my family ; and I can more confidently
speak,

speaking, with much pleasure to myself. If I should prevail on others to follow me in this pursuit, I am certain I shall not deceive or mislead them.

The years spent in public life I cannot help reviewing as a sacrifice of time and health. For above 20 years, not one object contended for attained!—The corrupt influence of the Crown has increased, is increasing, and not likely to be diminished. To what quarter can we now look with any degree of confidence, for its being reduced within proper bounds? It is not from the attacks of external enemies I fear the ruin of the country, but from an accumulation of abuses which are likely to obscure, defeat, and prevent, the wisest and best of all human governments answering its great end and object, in promoting the happiness and felicity of the people.

Statement of the Quantities and Amount of Sales of Milk from the Schoolhouse Farm, for the Years ending October, 1806, 1807, and 1808.

For each fortnight, Sold to the Town, &c.				For each fortnight, Sold to the Town, &c.				For each fortnight, Sold to the Town, &c.			
1805-1806.				1806-1807.				1807-1808.			
Fort-nights.	Gallons.	Quarts.	£ s. d.	Fort-nights.	Gallons.	Quarts.	£ s. d.	Fort-nights.	Gallons.	Quarts.	£ s. d.
1	251	3	7 11 7	1	495	3	16 7 11½	1	506	2	17 17 11
2	384	0	12 16 0	2	466	2	15 11 0	2	548	3	19 4 10
3	414	3	14 17 6	3	515	1	17 10 1	3	633	3	20 3 6
4	461	1	15 10 10	4	612	2	20 8 4	4	619	3	21 4 2
5	625	3	24 9 6	5	638	3	21 12 4	5	735	0	25 9 0
6	690	2	24 7 2	6	675	0	22 17 8	6	828	2	28 13 0
7	706	2	24 7 2	7	680	2	23 9 8	7	947	1	32 19 0
8	698	0	24 15 6	8	719	2	23 7 10	8	1017	1	34 11 10
9	687	3	23 16 4	9	735	1	24 17 2	9	937	2	32 15 0
10	651	1	22 19 8	10	756	0	26 0 6	10	912	2	32 15 0
11	641	3	22 17 2	11	869	3	29 15 4	11	960	0	31 18 8
12	682	2	24 4 2	12	923	0	31 11 0	12	895	0	31 5 0
13	687	1	24 2 8	13	931	2	32 8 10	13	923	3	31 4 2
14	718	1	24 4 9	14	914	0	31 16 10	14	952	3	31 15 2
15	611	3	20 8 2	15	795	2	25 8 8	15	1126	0	38 16 8
16	632	2	21 15 0	16	766	2	21 8 8	16	1054	3	34 5 2
17	632	0	21 6 1	17	509	2	14 6 10	17	1031	3	33 10 6
18	594	1	15 4 1½	18	638	0	15 15 2	18	892	3	26 18 0
19	372	0	9 14 5	19	571	0	14 10 6	19	737	2	24 9 8
20	324	1	8 10 11½	20	521	2	13 11 6	20	716	0	23 7 8
21	264	2	6 12 3	21	521	2	12 12 1	21	637	1	19 19 2
22	267	1	3 12 11	22	508	3	12 4 16½	22	635	9	20 18 2
23	319	3	7 19 11½	23	601	2	14 8 1½	23	701	3	22 13 10
24	324	1	8 7 11½	24	692	1	16 8 1½	24	703	0	23 1 4
25	423	2	10 19 12	25	602	1	14 13 6	25	741	0	23 6 0
26*	829	2	21 12 9	26	473	3	14 11 1	26	716	0	23 9 0
13022		3	445 16 1	17004		0	528 10 3	21126		2	707 8 3

* This year is 27 fortnights.

W. M. SWINBURN.

THE result of each year's practice is now detailed : In consequence of improvements in the mode of conducting the dairy, the profits have progressively increased. I now turn to contemplate other objects, which arise out of the system.

However great and desirable the object of supplying milk to the poor, we lose sight of it in contemplating the prosperity and happiness that would result to all ranks of the community, from being enabled to produce sufficient grain of British growth, not only to feed our present population, but to supply the means of providing for a considerable addition to it.

Is it possible to contemplate the saving of sixty acres of land in feeding so small a stock, without being struck with the powerful resources which the public, as well as individuals, have in their power to draw from the adoption of such a plan upon an extensive scale?

May I hope, through your indulgence and permission, to be excused in offering a few remarks upon the subject, which I trust will not be deemed irrelative, or wholly unconnected with that immediately before me.

Previous to entering into this discussion, I must beg to state, in addition to the saving made in feeding of cattle, there are annually forty acres or upwards of potatoes planted upon the same farm for feeding of horses, and given as a substitute for hay. An acre of potatoes produces, upon an average, fourteen hundred stone. Two stone of steamed potatoes, mixed with cut straw, are given daily to each horse : thus,

an

an acre of potatoes produces food for one horse for seven hundred days. Computing one hundred and sixty stone of hay to an acre, and allowing only a stone and a half to be given per day, with a small abatement for waste, an acre would feed one horse for a hundred days ; the scale of comparison, therefore, in feeding, between potatoes and hay, will be as seven to one. Agreeably to this calculation, forty acres of potatoes are equal, in point of feeding horses, to two hundred and eighty of hay ; and have the further advantage that, under proper management, the wheat after potatoes will not be inferior to a fallow.

I feel myself compelled to state, that wheat after potatoes, when necessity requires their being grown upon strong wet land, has not answered. Some parts of every year's crop has failed, but most particularly in the last season. I have found other inconveniencies from the desire of getting the wheat as early as possible into the ground : it has often led to the potatoes being taken up before they were perfectly ripe, which not only injures the quality, but endangers their keeping. When the season leaves no alternative but turning the furrows wet, and the seed is sown in that state, the moisture too speedily destroys the farinaceous matter which should support the germination of the grain, and hence a sickly weak plant is produced, that has no strength to get sufficiently deep-rooted to resist the spring frost : and further, ground ploughed in a wet state is more acted upon by frost. The lightness of the land where the culture has been complete
contributes

contributes to the admission of air and moisture, by which means the plants are more severely acted upon by every change of atmosphere.

Greatly as I am disposed to pay respect to whatever comes from Sir Joseph Banks, I can by no means accede to the proposition, that the poorest grain is equal to the best, for seed. Mr. Ellman, who does not yield in judgment and experience to any agriculturist in the kingdom, made a variety of experiments, and found the increase invariably in proportion to the care and attention bestowed in the selection of seed. It is a great object to have the seed all of one kind, that it may be ripe at the same time. I have in various instances in the last year selected and picked every ear of wheat, paying particular attention to have them all of the same shape and size. To speak decidedly upon this or any other point; requires a variety of experiments, as well as an attention to circumstances, more minute than is generally supposed; hence the number of erroneous experiments that are given to the public. I perfectly acquit the parties of intention to mislead; they are themselves deceived, and only speak as they think. That which is generally supposed to hold good in any other instance in nature, is not likely to have an exception in grain.

Fallows are exempted from this, by their being sown dry, and having time to acquire a proper tenacity before the wet season comes on.

From the experience I have had, I have determined to change my plan, and take oats after potatoes; the ground to be prepared as expeditiously as the season will

will admit, and every precaution taken to keep it equally dry as if under crop.

The oats to be drilled as early in February as the season will permit the harrows to work.

Sixteen acres of oats after potatoes, in the last season, proved a most abundant crop, and will yield from 60 to 70 Winchester. The clover plant most promising.

In April, after one or two hoeings, as circumstances may require, the clover to be sown.

Wheat to be taken from the clover root after one year's cutting. The clover root is calculated to weigh thirty-two hundred weight.

Wheat with one furrow, from the first year of clover lea, has not answered. From what cause I am not able to state, having been absent for some time after the sowing. Whether the fault was in the ploughing, by setting the sod too much an edge, by which means the young plants struck into the hollow and had not sufficient means of support; or whether the soil was so light, that the grain was thrown out of the ground by the frost. I have tried it with one and two furrows in the present season. I have found a top dressing of hot lime after the first cutting of clover to answer a most excellent purpose; I thought it preferable to soapers' waste. From gypsum hitherto I have not been able to discover any effect. In various parts of Scotland, and Northumberland, winter wheat is sown in spring, supposing it to be less likely to be affected by the mildew. From the belief that wheat after clover is more subject to mildew, &c. it has been entirely relinquished in many parts of the north of England.

England. It is strange such contrariety of opinion and practice should exist in different parts of the kingdom. Wheat after turnips is esteemed in the north most likely for a good crop. Spring wheat has not yet had a fair trial; I much doubt whether it will be found as profitable as barley or oats.

Since the above was written, I have ascertained the produce of two Winchester, sent me by Mr. Gibbs, of Piccadilly, and sown upon one acre three roods and seven perches; it produced 54 Winchester and a half; some shot above 30 Winchester per acre, weighing 58 lb., was sown the 16th of April, and reaped the first week in September. I had myself 50 acres this last season, and tolerably good; as it had been sown rather too thick, I had more straw than was desirable. The following account is taken from Sir John Sinclair's Report of Spring Wheat:

Mr. John Wright, of Pickworth, near Stamford, who has made many experiments for the Board of Agriculture, has made the following calculations of the relative value, from a trial of a rood of each sort:

	Crops.	Per quarter.	Comparative value.
No. 1	— Spring Wheat	— £ 3 0	— £ 1 4 7½
2	— Barley	— 1 16	— 1 2 7½
2	— Oats	— 1 4	— 1 1 2
4	Aut. Wheat	— 3 0	— 0 15 2½

Spring-sown grain is less subject to risk from the wire-worm, which in many places occasions great losses. In many districts of France where spring wheat was getting out of fashion, they have been obliged again to have recourse to it, as an essential source of supply.

By

By this system of tillage, in a farm of six hundred acres, a saving is made of three hundred and forty acres, above one-half of the whole; which, supposing it were cropped with wheat, would supply bread for the consumption of above a thousand persons. There were likewise cultivated upon the same farm, four acres of carrots, which, in feeding horses, equalled thirty acres of oats. I had last year eight acres; I have this present one (1807) twenty-two acres, which enables me to transfer the produce of sixty acres of potatoes, provided for the support of horses, to the maintenance of man! What a resource is this in years of scarcity!

Besides the stimulus of individual emolument which has hitherto been derived from this system, I have been strongly impelled to an extension of it, from the decided opinion I have long entertained, that nothing could contribute so essentially to the welfare and security of the empire, as being enabled to raise a sufficient quantity of grain for our support, and thereby to emancipate us from our dependence on foreign aid.

I lament, in common with many others, that the recent pressure, so severely felt by the nation, did not lead to an immediate inclosure of all the wastes in the kingdom.

Independent, however, of eight millions of acres of waste land, which are supposed still to remain, and from which little profit is derived, I conceive it to be not only feasible, but perfectly practicable, by a change of system, and adopting a plan of feeding horses and cattle in houses and sheds (both summer
and

and winter) to make such a saving of land as would accomplish this desirable object. Each acre so employed, as I have endeavoured to show, might be made to produce seven times the quantity of food raised from an acre of hay or pasture. The advantages derived from green crops, upon the present narrow scale, must be considerable. In what state would the agriculture of Norfolk and Suffolk be without them? Supposing the green crops in Great Britain to amount annually to a hundred and thirty or forty thousand acres, this would add a sixteenth part to the whole provision of the cattle and sheep. Subsequent experience has induced me to suppose I have underrated the green crops.

Supposing there should be in England and Wales fourteen millions of acres under cultivation, and that in well-cultivated districts, there may be annually from a tenth to a fifteenth under green crop: in Norfolk from a fourth to a seventh: were this system general throughout the kingdom, there would be nine hundred and thirty thousand acres and upwards in green crops, on the estimate of a fifteenth. The calculations of green crop throughout the kingdom have been one acre in a hundred, or one hundred and forty thousand. From the rapid improvements of late years, I should be inclined to believe there may be a seventieth of the land under tillage in green crops, or two hundred thousand acres. Allowing twenty tons per acre as an average medium of green crop, the produce would be four million tons of green food, estimating

estimating the food consumed by a beast of seventy stone, to be twenty stone of turnips, with some straw per diem; and that in twenty weeks, or a hundred and forty days, it should gain fifteen stone in weight. Thus, with a consumption of seventeen ton and a half of turnips, say eighteen, the produce of victual from green food would be forty-six million and a half of pounds, which would allow half a pound a-day to eight millions of people for eleven days and a half; and taking the weight of the whole carcass (being increased from sixty stone to seventy-five), it would furnish the same allowance for fifty-seven days; but were the system of one-fiftieth of green crop general throughout the kingdom, it would supply half a pound each for eight million of people for two hundred and sixty-seven days; and allowing a part to be sheep, the produce of victual would be a great deal more on the same quantity of food.

Nor are we to confine our views of the defective state of the existing system of agriculture solely to the want of winter food. The extension of green crops would introduce, in an equal proportion, the growth of clover, by which the produce of summer food would be quadrupled. Though one experiment will not justify the assuming the decided advantage of soiling for far beyond grazing, yet do I conceive it affords a very strong presumption.

Assuming the calculation to be sufficiently accurate for my purpose, which supposes England and Wales to contain about forty-eight millions of acres, and that
twenty-

twenty-one of these are under pasture for horses and cattle; I conceive a million and a half of acres might be taken from the lands in pasture, and brought under rotative crops, in aid of what is so applied at present.

I cannot entertain an apprehension that, from the capital possessed by Great Britain, any serious inconvenience could result to our general commerce, by the appropriation of such a sum as might be necessary to bring the newly-inclosed lands into a state of cultivation; though I have heard such arguments gravely urged as an objection to a general inclosure. In the county of Cumberland there are sixty thousand acres under inclosure; supposing the expense of fencing and bringing into tillage not to exceed 10*l.* per acre, or 600,000*l.*, it might be natural to suppose the capital requisite to accomplish this, and the quantity of land acquired, would tend to depreciate the value of land. The fact is directly the reverse; land never sold at such prices.

Mr. Malthus has observed, that "in any instance where a certain quantity of dressing and labour employed to bring new land into cultivation, would have yielded a permanently greater produce if employed upon old land, both the individual and the nation are losers by cultivating new land." Had this argument been well founded, the one thousand three hundred inclosures of wastes, which have taken place within the present reign, must have contributed to a decrease of victual. Has not an increasing population (with an improved mechanism) afforded hands to

carry on the extended cultivation, and is it not the established system of breaking up fresh lands by paring and burning and making use of lime, and fallowing for turnip, without taking any thing from the old lands? The system of sheep, as practised in Norfolk and Suffolk, contributes essentially to bring land into tillage; we have, besides, other resources for manure: among the rest, gypsum, which abounds in various parts of England. The transport of gypsum in America is said to give employment to ten thousand ton of shipping: in such great estimation is it held in that country.

I should have no doubt of the means, and as little of the spirit of enterprise, provided it were clearly ascertained that the capital so employed would be equally profitable with other branches of commerce. To procure, in the first place, the additional number of hands that this extended cultivation would require, might be attended with some difficulty; but should the consequences of the encouragement given to agriculture prove a temporary check to our increasing manufactures, or even lessen the number of hands now so employed; so far, in my humble opinion, from its being injurious to the interests of the empire, I believe it would be found to promote them. I do, however, apprehend the hands necessary might be found without any interference with trade. Might not numbers of industrious labourers be procured from the Highlands of Scotland, who, wanting employment, are obliged to emigrate to America? Many are kept at home by the public works that are carrying on, but
which

which must have a termination. Numbers also might be drawn from Ireland, without any injury to its present state of agriculture and commerce. Should it cost the public half a million to settle the persons so collected in villages in different parts of the kingdom, could such a sum be better employed? The bounties on importation, in years of scarcity, would in a few months swell to a larger amount.

The increased demand for labour, with the means of subsistence at a *reasonable* rate, would, in a very short period, produce an increase of population to answer all purposes.

The number of useful hands (by this means added to the population of the empire) would prove a powerful acquisition of strength. Can there be a more cogent argument in favour of growing the grain requisite for our own consumption? Were all other considerations balanced, is not this one abundantly sufficient to decide upon the wisdom and policy of our attempting it? Under our present circumstances, one million of British subjects depend upon foreign countries for the means of their subsistence. In the course of time, when the north of Europe and America shall have made a further progress in manufactures, what is to become of that part of our population which is supported by them? If it be more advantageous to be a nation of manufacturers, than cultivators of ground, what country will continue to pursue agriculture for the benefit of another? If the example of Great Britain, in her predilection for manufactories

in preference to agriculture, operate on other countries, the period is not distant when these supplies may be supposed to fail us. An alteration has been attempted in this system, and much appears to depend upon the firmness of Parliament, whether it shall be persevered in, and encouragement be given for the growth of British grain ; or whether popular clamour shall prevail and defeat it, by acting upon the feelings of the moment : blind to every prudential consideration, regardless of future consequences, and ignorant and insensible of our growing dependence on foreign countries for a very considerable portion of our daily bread.

The measure adopted in the last sessions of parliament for stopping the distilleries and permitting the use of sugar, had my decided reprobation as a plan connected with West India relief. This I believe to have been solely the object in bringing forward the proposition. In the course of the examinations before a committee, the perilous situation the country might be in from a defective crop in the ensuing harvest was so strongly enforced, that Ministers found themselves borne out in carrying the measure on grounds totally different from the views with which the business had been brought forward. As a precautionary measure against scarcity, it was wise and politic. Fortunately the apprehensions entertained of injury to particular districts have not been realized. In resorting to this measure in future, when circumstances require it, less fears will be entertained. It becomes the legislature

to

to look with great jealousy at every measure which can, under any possible circumstances, interfere with the interests, or check the spirit of agriculture.

The elucidation thrown upon this subject (by the discussions on the Corn Laws which took place in the last two sessions of Parliament) must, or at least ought, to have demonstrated to every unprejudiced mind, the necessity of efficient means being taken to encourage the internal growth of grain. However unbounded our capital, can the country be esteemed really flourishing, or secure, whilst it is not possessed of the means of feeding its inhabitants? The temporary loss of our superiority at sea, hostile influence, or a combination on the Continent, might effect by famine, what their attempts by open war, I trust, can never accomplish. Is there wisdom or policy in suffering the empire to remain dependent on circumstances, distinct from its courage and love of liberty?

The wild and preposterous speculations broached a few years back, that it was more for the interest of the nation to purchase than to grow grain, were well and ably refuted by a noble Lord (Sheffield) at the time. Experience has since fully proved the folly and impolicy of the system founded on this theory. Much praise is due to all those who contributed to the establishment of that venerable code, which for the space of eighty years proved such a source of wealth and internal comfort to the nation. The Minister (Mr. Pitt) had great merit in resisting the clamour raised against the alterations in the Corn laws in the last session of parliament, and in the support and

countenance previously given to Mr. Western's Act; It was most satisfactorily and clearly proved, that those alterations had no influence in raising the prices of grain. They might, and I believe did, encourage a more extended growth of corn; and, by so much as they increased the quantity, contributed to keep down the price, and diminish the effects of a failing crop. What reason can there be to doubt, that a recurrence to the same measures would be productive of the same effects? During the seventeenth century, and at almost every period of our history previous to the establishment of the system of bounties on exportation, the price of wheat was subject to great variation, and the average extremely high. For forty years previous to 1700, the average price of wheat was 3*l.* 0*s.* 11*d.* per quarter; prior to 1650, 6*l.* 8*s.* 10*d.* From the period that the Corn laws were finally settled in 1700 or 1706, the prices became steady. And for forty years prior to 1750, wheat was at 1*l.* 16*s.* per quarter; in the next forty years, to 1790, the average was 2*l.* 9*s.* 5*d.*; and for the last ten years, 3*l.* 6*s.*, exclusive of bounties.

In the course of the last forty years, the balance between the agricultural and commercial systems has been destroyed. The latter now clearly preponderates, and its excess is likely to become ruinous. All the apparent advantages supposed to be drawn from manufactories, will not on examination be found real. For example, Lancashire, the most manufacturing and populous county in Great-Britain, containing 1,129,600 acres, of which a million may be presumed

presumed to be under cultivation, and above half that quantity of acres in the vicinage of the manufactories, with the necessities of life dearer than in any other district. I would ask any one acquainted with the state of cultivation in that county, whether the produce on an average might not be advanced five pounds per acre by a better mode of husbandry and attention to the soil. If I am correct, and I believe the only error will be in taking the estimate too low, there is two millions and a half of produce annually lost to the community. In stating the gains made by the manufactories this ought to be deducted. I lament the opportunity was lost of making great and important improvements in this county, I mean during the recent suspension of their works. It would have been both good policy as well as gain to the parishes had they applied to the landed proprietors to employ the people, and as a temptation to do it, paid a part of their wages out of the poor-rates—there would ultimately have been a saving to the parishes: and what improvements might not have been made, at once beneficial to the individual, the parish, and the public, and the disgraceful scenes prevented which ensued. How frequently does it happen that our misfortunes under wise and prudent government may be turned to a source of profit!

The increase of wealth operating on a decreasing supply of corn, has greatly tended to aid in raising the price of labour, to the injury of agriculture. The reduction of the price of labour cannot be effected, without a general abatement of all the objects which have

been influenced by it. The only means of preventing the ruin of our agriculture is to advance the price of grain. The same causes have not yet operated in the North of Europe and America; where they are besides, exempted from our heavy taxation, which exacts so much from each individual, and appears an almost invincible barrier to our receding. These combined causes enable the North of Europe and America to furnish grain cheaper than we can grow it extensively. There are indeed many millions of acres in Great Britain that would produce wheat, were the price sufficient; but on which it will never be grown while foreign grain can be imported as heretofore. And I still doubt of the average being taken too low to produce any considerable change.

The situation to which the country is reduced, calls for the adoption of efficient measures to rescue it from the distressed state into which it has been thrown by the predominance of commerce over agriculture. Every step we advance, the difficulty will be greater. Remedies are never pleasant; when necessary however, they should be adopted.

Grain, the prime necessary of life, must be had; and, if it cannot be grown at the prices hitherto paid, it is sound policy to advance them to what will stimulate the production of a quantity equal to our wants.

To accomplish this object, should it even be the means of a diminution in our manufactures, the nation would be no loser by it. Our supplying foreign countries with manufactured articles depends upon a variety of circumstances. Our demand and consumption

tion of grain is certain. One may cease ; the other cannot be dispensed with but by a diminution of our population. Could a more serious misfortune befall the country than to be driven to such an alternative ?

Allowing the prices of grain were such as to make it the interest of the farmer to grow corn extensively, in preference to grazing, or fully on a par with it ; can it be doubted that we should shortly be enabled to raise a sufficiency for our consumption ? The profits of tillage once fully established would speedily effect a total revolution in the existing system of agriculture. When no longer the interest of the farmer to make use of every possible means of expeditiously turning his lands into grass, expedients would be as assiduously devised for continuing the lands in a fit state for cropping. And I conceive this to be practicable, without injury to the land, or reduction of crops ; for which we have not only the example of China, but the partial practice of different places in this kingdom. There are lands in the neighbourhood of London, which have been cropped with potatoes for forty years without interruption. The alternate culture of wheat and beans is practised in many districts without variation.

The advances in the prices of grain have saved the country ; at the commencement of this war great importations were necessary ; we are now in tolerable years in a state to supply ourselves, and the quantity of grain grown in Great Britain and Ireland annually increasing to a great amount, arising not only from large and most extensive enclosures of wastes, but from

from an improved system of cultivation, which bids fair to double the produce in a very short period.

I would not be considered as an advocate for the advance of grain beyond what would afford the grower a full, fair, and adequate return for his capital and exertions ; which I do contend has not been the case in the last ten years (prior to the alterations made in the corn laws), with the exception of those of scarcity.

It is a matter of some curiosity to trace the price of wheat from the earliest times. The prices tend to shew the progress of improvement.

PRICE OF WHEAT AT DIFFERENT PERIODS.

As nearly as can be conjectured, the mean price of wheat from the year 1000 to 1066 (the time of the Norman Invasion) was 1*s.* 6*d.* per quarter. From the latter period, to the first year of the reign of King John, 1199, the mean price of wheat was 3*s.* 1*d.* per quarter. In 1244, wheat was 6*s.* 2½*d.* per quarter, and two years after 2*l.* 9*s.* 7*d.* The mean price of wheat during the next period, viz. from 1307 to the Declaration of War against France by Henry V. in 1418, was 15*s.* But though the mean price is less in this than in the former periods, yet from 1314 to 1316, it was sold at 3*l.* 1*s.* 2*d.* per quarter ; in 1317, at 6*l.* 14*s.* 7*d.* These excessive prices of wheat caused great mortality, and certainly indicate bad husbandry—but it would appear that something had been done with respect to tillage very soon after, for in the year 1319, the importation of corn was prohibited, unless the price of wheat.

wheat exceeded 19s. 10½d. per quarter at the port where the same should be landed. In 1349, wheat sold at 5s. 6d. per quarter; this remarkable fall was occasioned by a dreadful pestilence which swept away nearly one-third of all the people in Europe. From 1418 to 1524, the mean price of wheat was 11s. 3d.; and from 1524 to 1604, 15s.; though in the year 1573 wheat rose from 1l. 4s. 9d. to 2l. 17s. 8½d. per quarter. During the whole reign of James I. the mean price of wheat was 1l. 12s. 3½d. During the whole reign of Charles I. corn was very dear, chiefly owing to the great plenty of money.

The adoption of measures for creating an advance of price might appear an evil, so long as grain could be had from foreign countries at a cheaper rate. But the miseries which must and would ultimately result from an increasing dependence on foreign nations would infinitely outweigh any present advantage. And besides, it admits of considerable doubt (taking the average of a few years back), whether it would not have been cheaper both to the nation and individuals, had measures, like the present, been taken some years ago, to advance the price, and thereby to encourage the growth of grain at home.

At the moment of writing the above observations, it was far from my contemplation to suspect that such a fatal combination of circumstances would arise, as should threaten the total deprivation of our resources drawn from the Baltic. The event, however, has happened; and we cannot but clearly perceive, that
the

the power of producing grain for our own consumption is become an object of still greater importance than at any preceding period, and that sound policy should stimulate our rulers to use every means in their power to introduce and promote an improved system of agriculture throughout every portion of the empire.

The Baltic is now proved to be no more free from the power, than she has formerly been from the influence of our inveterate enemy ; and may not the same intriguing spirit labour to involve us with America, should the moment of scarcity make us dependent upon her for the supply of our necessities ? The event here contemplated has actually taken place, and I hope and trust it has proved most fully, that Great Britain never can nor ought to consider herself *secure*, till she has provided the means of furnishing herself with all the necessaries of life. The friendship of America can never be relied upon ; and if it produces the effects I hope it will, the nation will have no cause to regret it. To be in security, the British empire must produce grain equal and above all her wants. May this principle never be lost sight of, and influence and direct the measures of whoever may be the ministers of the country !

It has been a question of much doubt with me, how far it is wise to suffer France to supply us with surplus grain. The power of so doing has furnished her with the means of supporting her immense contributions, by opening a ready market to her surplus commodity, and has prevented her suffering the full portion of the miseries of war. What are our advantages

tages derived from this indirect and impolitic commerce? a reduction of some few shillings per bushel in the price of wheat:—But is a trifling enhancement to be prevented at all hazards? Would not the addition of price have forwarded the important object of raising within ourselves a sufficiency of grain for our own consumption? Is not an adherence to this system a sacrifice of our real welfare at the shrine of manufacturing interest? Can a foreign supply, and, least of all, a supply from France, be relied upon? Were the demand pressing on our part, would it not be withheld?

The present underhand intercourse may, therefore, be fairly said to promote their agriculture; to enable them to continue the war with fresh resources; and it cannot fail of operating as a discouragement to our internal improvements.

Surrounded as we are by millions of devoted slaves, who envy us our freedom and happiness, and whose enmity will never be assuaged but by the total destruction of a country, so strikingly contrasted as Great Britain with their own degradation and misery, we should carefully adopt means of defence and support commensurate with the extent of the immediate danger, as also with the pressure of more remote calamity.

Years of failure in the crops must, in the course of events, be expected. A demand for importation beyond the usual supply has an immediate effect on the foreign markets, and subjects us to whatever demands speculators may think proper to exact. Considering the

the few hands in which the foreign trade is placed, the means of combination are not very difficult. Widely different is the case with our home supply. When there are half a million of manufacturers of grain, the public has little to fear from monopoly.—By which of these systems are we likely to be most cheaply supplied?

The price paid in our markets for foreign grain was not the price it cost the consumers; a most material addition must be made for the bounty, which did not enter into the contemplation of most of the purchasers.

However much we may regret the late high prices of corn, it must be admitted that some good has resulted from the pressure, by producing an increased activity, and accelerating improvements in agriculture in every part of the empire; which, in the ordinary course of proceeding, would have required many years to accomplish. It has also created a spirit of enterprise, which may be turned to good account: and from what we have seen done, we may justly entertain the most sanguine expectations of still further improvements being effected. Without profits, would the manufacturer continue to prosecute trade? Can, or ought the farmer to be expected to do it? The alarming disparity which has taken place in the course of the present reign, between the growth and the consumption of grain, is a subject worthy of our most serious consideration. They who are inclined to attribute it solely to the increased population, look, I conceive, but partially at the question. Were this the fundamental cause, its effects would have been of a slow and
and

and progressive nature. The population of Great Britain is supposed to have gained, in the last century, an addition of nearly three millions, which would give an annual increase of thirty thousand persons. Whether this may, or may not, have been the proportion, or the increase have been more rapid at one period than another, I shall not contend ; but I think it will be conceded to me, that the checks on population have been greater since the year 1760, than they were for fifty years preceding it ;—notwithstanding the great increase of manufactures, and that the improvements in agriculture have been in that period more than double what they were in the former : and in addition to this we must add, the inclosures of nearly 1300 wastes and common fields.

The number of Inclosure Acts passed in this reign, at an average of four years from 1780, will give the following results :

In the first 4 years, per annum,	23
2d do. do.	24
3d do. do.	35
4th do. do.	66
5th do. do.	75
6th do. do.	70
7th do. do.	75

In the last sessions there were 82 acts for inclosures.

This proves, that the capital employed, as well as the spirit of agricultural improvements, have been rapidly encreasing in the latter part of this reign.

The

The consequences resulting from all these circumstances must be, a prodigious increase of victual, tending to form a counterpoise to the increase of our population within these last forty years. It is well known that we had a surplus, in 1761, of 925,119 quarters of wheat, which alone would have fed 925,000 persons. Five years after this period, in 1766, we had barely sufficient for our own consumption; and from that period we have been obliged, with few exceptions, to make great annual importations. Such a change is too great and too sudden to be attributed to any progressive cause, or to the annual increase of population, but must, I conceive, be deduced from other causes. And I think we shall find a most important change taking place about this period in the habits and modes of living of a considerable portion of the people, and which has produced an alteration in the system of agriculture. That other causes have also contributed I have no doubt.

There are, unfortunately, no means of investigating, by positive proof, the alterations which must have taken place in the system of agriculture. It would, in my humble opinion, be productive of essential benefit to the empire at large, were an accurate survey taken of the whole kingdom, and a register kept in every parish, of the appropriation of each acre of ground. By thus ascertaining the various crops, and the produce of each kind of grain, Government would be enabled to take timely steps for providing against deficiencies, and a general plan of economy would be adopted,

adopted, as was the case in the late years of scarcity, for the prevention of evils infinitely more grievous than those of price.

I strongly suspect that a great and most material change in agriculture must have happened within the last fifty years. The exportation in common years, up to 1761, was nearly equal to the growth of three hundred thousand acres. The largest year of importation since 1790 was adequate to the produce of nine hundred thousand acres, very little short of a third of the whole growth of the kingdom. Estimating ten millions of people in England and Wales, and our colonies, to be fed with wheaten bread, and supposing one million to subsist on barley and oats at an allowance of one quarter for the support of each person; three millions three hundred thousand acres must be annually cropped to answer their consumption. To this estimate must be added whatever grain is used in the manufactures, which may extend to the produce of eighty or a hundred thousand acres. A twelfth part of this quantity is calculated to be deficient, and annually imported. In average years this would require the growth of near 285,000 acres.

It cannot be doubted, that the increased population of the country has had its share in creating the deficiency; but I consider the great and principal cause to arise from the increase of commerce, and the decrease of tillage. The wealth acquired in our various branches of manufactures has been the means of advancing wages, by which numbers of hands have been drawn from the country into towns. The consequence of

this has been the entire change in their habits and modes of life ; their former frugal manner of living is abandoned ; and they are no longer, as heretofore, fed upon milk, cheese, and vegetables, with little or no animal food. *Less than two acres and a half* was THEN amply sufficient for the support of a labourer.

The whole body of manufacturers (as well as most of those employed in great towns) are since that period subsisted upon butcher's meat, with the constant use of malt liquor ; and, there is too much reason to fear, the pernicious habit of using spirits is but too common amongst them. Five and a half acres of land will now barely suffice to furnish each person with the various articles of food and liquor. Supposing the number of manufacturers, and others connected with trade, to amount to three millions, to support them in the manner they now live, would require an increase of land, which (according to their former mode of life) would have supported an additional population of four millions. We must also add, as further causes of the deficiency, the great increase of our naval and military force ; the waste of every article of prime necessity in the families of the opulent, multiplied out of number by our commerce. These combined causes have all contributed to increase the demand for animal food, and consequently to operate, with other causes, in lessening the growth of grain. The increase of butcher's meat in country markets, within fifty years, is prodigious. Meat that was provided only at particular seasons, is now weekly, if not daily, offered for sale throughout the whole kingdom.

The

The increase of numbers, as well as luxury, of the capital, is strongly exemplified by the following account of the sale of cattle in Smithfield market. But for the improvements made in the different breeds of cattle, the quantity could neither have been produced nor fattened that is consumed there and in different parts of the kingdom.

The following Averages, computed at the distance of nine years each, show the number of Cattle and Sheep sold in Smithfield * :

	<i>Of Cattle.</i>	<i>Of Sheep.</i>
From 1732 to 1740, per ann. the average was	83,906	564,550
1741 — 1749, - -	74,194	559,892
1750 — 1758, . .	75,331	623,091
1759 — 1767, - -	88,432	615,328
1768 — 1776, - -	89,362	627,805
1777 — 1785, - -	99,285	687,588
1786 — 1794, - -	108,075	707,456

We are not informed of the average of the last seven years, but understand it considerably exceeds that of any former period.

The following is a comparison between the average weight of Bullocks or Oxen, &c. 100 years ago, and at the present time :

	lb.	lb.
Oxen, 100 years ago, weighed	370	now 800
Calves, - -	50	— 140
Sheep, - -	28	— 80
Lambs, - -	18	— 50

* Monthly Magazine, February, 1802, page 77.

Smithfield market has (taking the increased weight of the carcasses into calculation) doubled the weight of flesh sold within fifty years. If such has been the increase in the capital, where luxury ever predominated, what must be the increased consumption of meat throughout the whole empire?

The late Doctor WALKER, of Collington, my much respected friend, has stated in his *Communications to the Board of Agriculture*, (vol. III. part I. page 16), that "a Scotch acre of good grass land, worth 40s. of yearly rent, will support and fatten five of our best sheep from the first of May to the first of November; during this time the sheep will increase in weight 6lb. per quarter, or 24lb." A Scotch acre is five roods; the produce of an English acre would be 96lb.

It is evident there requires some explanation to reconcile the above statement with the rents paid for grazing in various parts of the kingdom; for instance, in Northumberland and Durham, five pounds are paid an acre for grass lands many miles distant from any market-town; whilst Dr. Walker's profit upon an English acre amounts only to 3*l.* 12*s.* This apparent contradiction does not arise from the different qualities of the land, but from the superiority of one stock over another in early maturity, and its propensity to fatten with a less quantity of food. I was highly gratified, and perfectly convinced of the high perfection to which they have brought their stock in Northumberland and Durham, by the communications of many valuable experiments

experiments made by various gentlemen of those counties.

It is the opinion of that very spirited and celebrated breeder and agriculturist, Mr. C. MASON, that their best grounds would carry five and six Leicester sheep for the six summer months, and that they would gain from 8 to 9lb. per quarter, or from 200 to 216lb. and that the quality of land for laying on fat might vary from 36 to 216 lb. From other quarters I have been assured, that there are instances of short-horned cattle gaining 28 st. in four months, and 40 st. in six months. Allowing the latter beast to have had an acre and a half, the produce would be 378 st. per acre; this makes the increase on cattle nearly double that of sheep, when the very reverse is the case in feeding with turnips. This produce greatly exceeds the opinion of very scientific persons, who suppose 14½ st. to be a fair estimate of what might be gained from one acre in grazing cattle; but so much, I am convinced, depends upon the animal, that it is almost impossible to fix any correct standard for general purposes. The long-horned cattle, for example, are such slow feeders, that they had led me to conclude, that but for the object of making manure, feeding paid nothing, and that it was impossible to purchase turnips at ten guineas an acre, to make profit of them.

The following interesting experiment, on the feeding of four Leicestershire ewes, was made by Mr. C. Mason. They were fed on turnips and cole-seed, from the 15th of August to the 4th of October, both days inclusive, or 51 days. The food was weighed

134 *On supplying Milk for the Poor.*

both to and from them. Their consumption was 18lb. per day each.

Weight before feeding.		Gain.	Total.		
st.	lb.	lb. oz.	st.	lb.	oz.
6	8 $\frac{1}{4}$	14 6	7	8	10
5	12	13 11	6	11	11
6	3 $\frac{1}{2}$	15 6 $\frac{1}{2}$	7	4	14 $\frac{1}{2}$
6	7	14 3	7	7	3
<hr/>		<hr/>		<hr/>	
25	2 $\frac{3}{4}$	57 10 $\frac{1}{2}$	29	4	6 $\frac{1}{2}$
<hr/>		<hr/>		<hr/>	

29st. 4lb. 6 $\frac{1}{2}$ oz.

The weight of green food consumed by the four sheep, is 262 stone; which, at $\frac{1}{2}d.$ per stone, amounts to 10s. 11d. An acre of 34 tons of bulbs, which is a common weight in Northumberland, would, at the same price, produce 11l. 6s. 8d. The increase of carcase, at 6d. per lb. would be 1l. 8s. 9d. The result of trials of feeding of other stocks, were stated, by which it appeared the sheep consumed each 24lb., which would reduce the profit one-fourth on every acre. This explains, in the most satisfactory manner, the mystery and apparent contradiction in the gain of weight in feeding of different stocks, and most completely and fully justifies every expense in obtaining stock of the first reputation. Mr. C. Mason's Leicesters would pay after the rate of 30l. per acre for turnips, whilst the other sheep would leave only 22l. 10s. 7d. or a fourth less. If I had not obtained
the

the above statements from persons on whose correctness I could depend, I should not have thought it possible there could have been such a difference in the consumption of food between one animal and another, whose weight and size was so nearly the same.

Mr. Bayle, of Chillingham, has made some very interesting experiments in the feeding of sheep. I understand he found the quantity of turnips consumed greater after Christmas than before. As soon as they are disposed to run to seed, they lose considerably of their density. I hope it will not be long before the results are made public. Whatever comes from this gentleman is peculiarly entitled to attention.

There is no branch of agriculture more important, nor in which the interest of the individual and public are more concerned, and I believe I might add, nor less accurately ascertained or understood, than that of the consumption of food, and the acquirement of weight in different animals. I am indebted to Mr. Bates, of Holton Castle, Northumberland, for the following communication on the feeding with hay and turnips.

	<i>Hay. Turnips.</i>	
A short-horned cow consumed in the		
24 hours,	-	36 lb.
The same beast, a year afterwards,	22 lb.	6 st.
A crop of the Kylo, and short-horned,	18½ lb.	
A second year	-	10½ lb. 6 st.

A four-years old ox of the Kylo, and short-horned, consumed daily 16 st. of turnips for 20 weeks. (Its weight, when put to feed, was 45 st. and it gained

K 4 15 st.)

15 st.) With the produce of two acres and a half of straw, this pays 11*l.* 16*s.* per acre of 34 tons for turnips.

Mr C. Mason, and other intelligent feeders, were of opinion, a beast of sixty stone (14lb. to the stone) would in 20 weeks, with an allowance of 20 st. of turnips per day, and some straw, gain 15 st. in weight; this pays 10*l.* 4*s.* per acre for turnips.

The state of fatness to which the short-horned cattle will arrive, and their propensity to fatten, can scarce be credited by those who have not seen the stocks of Mr. C. Mason, Mr. Collins, and other celebrated breeders of the short-horned cattle.

The consumption of food of animals, per day, is estimated in proportion to their weight as one-third to two-fifths. Mr. Mason's sheep consumed rather above a 5th of their weight, the other stock about a 4th. It must be observed, however, that the profit upon feeding of large and small animals, is not exactly in the proportion of the food consumed. There is an advance of 2*s.* per stone in the value of their original weights. For instance, a lean beast when put to feed is worth 6*s.* per stone, when fat it is advanced to eight. The account of profit between the two animals should stand thus:

A beast of 60 stone, supposed			
to gain 16 stone in 20 weeks'	£	s.	
feeding		5	5
Two shillings advance on ori-			
ginal weight		6	0
Carry forward			
		11	5 0
			Brought

	£	s.	d.
Brought forward	11	5	0
Value of turnips consumed -	5	16	8
	<hr/>		
Clear profit	5	8	4
	<hr/>		
A beast of 45 stone, gains 15	£	s.	
stone in 20 weeks -	5	5	
By advance in original weight			
in 20 weeks -	4	10	
	<hr/>		£ s. d.
			9 15 0
Expense of feeding -	4	13	4
	<hr/>		
Clear profit -	5	1	8
	<hr/>		

Though the food of the larger animal costs 1*l.* 3*s.* 4*d.* more than the lesser, the profit from its original weight is 6*s.* 8*d.* in its favour.

The advance of weight on feeding with turnips will be in the following proportions :

Mr. Mason's Leicester sheep gained 1*lb.* on 64*lb.* of turnips, or 2 stone 10*lbs.* per ton.

The other stocks, 1*lb.* on 81*lb.*, or 2 stone 10*lb.* on a ton and a quarter.

A bullock of 60 stone (14*lb.* to a stone) 1*lb.* on 200*lb.*, or 1 stone on a ton and a quarter.

A bullock of 45 stone, 1*lb.* on 160*lb.*, with a gain of 1 stone 3½*lb.* on a ton.

By this it appears, the increase of weight in sheep in comparison with cattle is two to one in one instance, and

and in the other, about three to one. Cattle appear to give a stone on a ton of turnips, sheep 2 stone 10lb. Cattle, in grazing, on the contrary, advance 378lb. on an acre, whilst sheep gain only 216lb. There appears something so extraordinary and contradictory in this statement, that I confess I have my doubts as to the correctness of it.

Potatoes in feeding are supposed to advance cattle 3st. per ton, which in comparison with turnips is as three to one, but in point of price, potatoes are to turnips as four to one, and more generally six to one. When there is no opportunity of disposing of potatoes for human food, they may be applied with advantage to the feeding of stock.

The difference of opinion is so great amongst the best informed graziers, respecting the consumption of food, and increase of weight of animals, as to make it desirable that some measure should be taken to establish these facts on solid grounds, and to prove the necessity of a measure similar to that proposed at the last Ovingham Agricultural Meeting, by that spirited improver, Mr. Bates, of Holton Castle; viz. of devising, by a correspondence with the Board of Agriculture, and other Societies in the kingdom, some means of ascertaining the relative perfection of all the different breeds of stock, their propensity to fatten on the least food, and at the earliest maturity. The result of such an experiment would prove which stock were the most profitable. Heartily do I wish success to the plan! At present the choice of stock is governed by local prejudice or fashion.

Anxious

Anxious to clear up some of the doubts respecting the increase of animals, and the relative advantages of soiling and grazing, I undertake to make the following experiments, the result of which I shall not offer as conclusive, but as leading to more extensive trials. In the course of the present year I am proceeding with the feeding of two of each of the following breeds of cattle:—

Short-horned.

Long-horned.

Hereford.

Sussex.

Glamorganshire.

Galloway.

I was greatly disappointed in my endeavours to procure both Devons, and some of the best Scotch cattle. The experiment is made on two-years-old heifers. The weight and value of food, together with their progressive increase, will be regularly stated. To make such an experiment satisfactory, the breeders of the various stocks should agree in furnishing the cattle; as it is otherwise extremely difficult to procure the best specimens. The cattle are not fed for the purpose of *fattening solely*, but to show their increase on a plan of feeding, that will leave a profit to the farmer. To gain a pound of meat, at double its worth, cannot be an object worthy of either individual, or public attention. One fact is already clearly ascertained, that the increase of animals is neither according to their original weight, nor to the food consumed—unless I am incor-

rect

rect in estimating the advance of value on the lean weight, there is no comparison between a Highlander and any other stock. The Kylo appears to increase with half the consumption of food, as much as any other breed of cattle.

I had an opportunity of proving Dr. Walker's correctness, from an experiment made by a gentleman at Sunderland, who imports Scotch sheep, and feeds them five to an acre, for two years; they average, when lean, 13 lb. per quarter, and feed, in the two years, to 23 lb. per quarter, gaining 40 each, which gives 100 lb. as the product of each twelve months per acre. Had the same pasture been fed with Leicester sheep, they would have gained double the weight.

PRINGLE on the Diseases of the Army, states the nourishment contained in one ounce of animal food to be equal to what is derived from twelve ounces of vegetable.

Granting this to be correct, the comparison of the nourishment produced by grazing, and from the growth of grain, would be as follows: Two hundred pounds of animal food obtained from an acre of grass land, would be equal to two thousand four hundred pounds of wheat, or the growth of two acres.

The alteration of the Corn laws in 1773 operated still further to decrease the quantity of corn grown, by creating a competition of foreign grain in our markets; and that at a time when the profits on grazing were already greater than on growing corn.

Every burden which the necessities of the state
have

have since imposed has been a direct tax upon the plough, and consequently operated as a bounty on converting land from tillage to grazing. The increasing demand for workmen for our manufactories has united with other causes to enhance the price of labour, and operated as a further check upon agriculture.

The great acquisition and general diffusion of wealth have had the effect of increasing the number of pleasure horses. The very improvements in agriculture have made a larger proportional number of horses necessary, which has been further increased by the obligation of performing a great deal of work by horses, not only from the want of labourers in some districts, but also from the advance in the price of labour. The additional number of pleasure and agricultural horses has been the means also of consuming the produce of a considerable portion of the best acres in the kingdom, and has had a powerful influence in diminishing the growth of bread corn.

I am confidently of opinion that a million and a half of acres might be spared from the pastures appropriated for the support of horses and cattle, and applied to the production of grain. In confirmation of this persuasion, I beg to state in the first place what I conceive to be the quantity of land employed in the maintenance of the various descriptions of horses. By the returns of the Tax-office, we are enabled to ascertain with tolerable accuracy the number of horses in Great Britain.

The saving which might be made in feeding of cattle
must

must rest upon conjecture, as we have no accurate criterion. The trials I have made, justify the supposition of its admitting of very great retrenchment.

The number of horses that are entered and pay the duty, amounts to 1,178,000, as appears from the returns of the Tax-office; and if we add those exempted as belonging to the army, &c.; and make allowance for the occasional evasion of the tax, we shall not much err in taking the total number of pleasure horses at two hundred thousand : nine hundred thousand and upwards of husbandry and draught horses are entered ; and making the proper allowance for exemptions, and for such as may not have been returned, we may, I conceive, fairly estimate them at one million—Suppose then,

200,000 pleasure horses require	6 acres each or	1,200,000
30,000 cavalry	5	150,000
1,000,000 husb. and draught horses	4	4,000,000
200,000 colts, brood mares, &c.	3	600,000
<hr/> 1,430,000 horses.		<hr/> acres 5,950,000

Of the six millions of acres employed in feeding horses of various descriptions, suppose them to be divided between pasture and grain, allowing four millions under grass, and two for oats, I conceive, upon a moderate estimate, that a twentieth part might be spared by feeding draught horses upon potatoes, carrots, and straw, instead of hay, and soiling them in summer ; by which a saving of three hundred thousand acres might be made.

There

There is no object of greater national importance than the reduction of the number of horses kept for pleasure, and the transport of goods. From our inexhaustible resource of iron, it would be highly advantageous to have iron rail roads in every direction where there was any considerable transport of goods.

In the last year, I shall have made a saving of the work of thirty horses in my coal-works, by laying iron roads upon inclined planes. Ten years ago this great and important reform was suggested by my friend and agent Mr. Swinburne, but unfortunately it was not attended to, till the expense of horse labour became so enormous as to compel me to resort to every mode of retrenchment. The same plan may, in various cases, be adopted with equal advantage.

This would make so great a saving, supposing it general, that the horses so employed, as well as those for pleasure, might fairly be made an object of a still further taxation. Should the population of the country be at any period so increased, as to find a difficulty of obtaining employment, then the tax might with propriety be extended to husbandry horses. Manual labour so much surpasses the most perfect mechanical operation, that it will at all times insure a great superiority of crop.

If it be correct, that there are twenty-four millions of acres in pasture, deducting four millions supposed to be required for horses, there would remain twenty millions for the pasturage of cattle, &c. Does it admit of much doubt, that (by feeding milch-cows, and fattening cattle with green food, both summer and winter,

ter, in sheds) a saving of a sixteenth part, or one million two hundred thousand acres might be made? Granting then, that one million and a half of acres might be taken from the ground hitherto appropriated to the pasturage of horses and cattle we may naturally suppose them to be those nearest to towns, and of the best quality; most advantageously situated for manure, and consequently capable of producing above the average of estimated crops. But should I be thought too sanguine in my calculations, as to the quantity of ground that might be obtained,—still with a less proportion (from the nature of the soil and advantages of situation, from heavier crops and a more frequent rotation of wheat being taken) the object might be accomplished: supposing one-fourth part to be under wheat annually, it would supply all our present demands. By an appropriation of a fourth to green crops, a larger quantity of food would be produced than was supplied by the whole whilst under pasture; the remaining 750,000 acres could be left for other crops, and might be managed in such a manner as would prepare the quantity of land requisite for wheat. I might also with propriety state the prodigious saving which would be made by the general use of the drill. Upon the farm (to which I have so frequently referred) there are 100 acres sown with the drill, with a Winchester and a half to the acre, whilst the common practice of the district is three Winchesters. This makes a saving of 150 Winchesters, the cost of which would have been, at the time, 75*l*. The drilled wheat of last year averaged
thirty

thirty Winchester per acre, the barley of this, sixty-nine.

The expense of the mode of tillage I have practised and recommended is undoubtedly great, and its answering must doubtless depend upon grain keeping up its price. If wheat falls much below 10s. per bushel, I should despair of the profits being such as would repay the farmer.

In farms which are greatly out of condition, the first year's cost will be the greatest. A farm, once got into order, may be kept so, without incurring any extraordinary expense.

The average price of wheat for the last ten years I have stated to have been at 3*l.* 6*s.* per quarter, exclusive of bounties; had this been the price in the first five years of that period, I verily believe it would have proved such an encouragement to the growth of grain, as would have prevented the necessity of our prodigious importations, (and in great measure) saved the nation forty millions, paid for the purchase of foreign grain in that period, besides seven millions of bounties out of the Exchequer.

Taking six years from 1793, the average will be 2*l.* 17*s.* 6*d.* and excluding the years 1795 and 1796, which were both failing crops, the average of the four remaining years will be 2*l.* 10*s.* 8*d.* an advance of only fourteen shillings and eight-pence in a space of little less than a century. But permit me to ask, is there *any* advance? According to Sir George Shuckburgh Evelyn's Tables of the Depreciation of Money, in 1689, one pound had as great power over the ne-

cessaries of life as 2*l.* 9*s.* 8 $\frac{3}{4}$ *d.* had in 1800. If so, 1*l.* 16*s.* per quarter for wheat in 1700 would be equal in present money to 4*l.* 8*s.* 8*d.* and this without estimating taxes, advance of labour, or other charges of cultivation.

What branch of commerce do we possess that is capable of producing a net gain of upwards of four millions and a half annually? Such, however, is the trade we appear to despise, notwithstanding a very considerable part of our national prosperity depends upon it.

Let us pause a moment, and reflect on the prodigious importance of agricultural commerce, in the present state of our population. Ten millions of people, consuming each seven Winchesters of wheat, require seventy million bushels, which, at a cost of 9*s.* per Winchester, amounts to thirty-one million five hundred thousand pounds.

Thirty-two million bushels of barley were, in 1802, according to Mr. Addington's calculation, consumed in malt, which, at 5*s.* per bushel, amounts to eight millions. What is used in distilleries, and consumed for bread, with oats used in Scotland, and some parts of England for the same purpose, may be estimated at twelve millions.

Butcher's meat, at half a pound for each individual, forty-five millions, though this greatly exceeds the consumption, it will not be too great an allowance, if it be considered as including the charge for milk, cheese, butter, and vegetables.

Suppose three pounds a-head for cloathing, or forty-five

five millions, though this may appear too much for the cloathing of the lower orders, it falls short of the middling and higher classes. Taking Ireland at a little above a fourth of Great Britain, say twelve millions and a half.

Oats for horses, allowing 12 lb. for pleasure horses, and 8 lb. for farm horses, &c. amounts to sixteen millions, and the rent of four million of acres for grass and hay, at one pound per acre, makes the whole cost of feeding horses twenty millions, or 25l. per horse.

One million of colonists supplied from Great Britain, are included.

Double our population, and what almost incalculable resources of internal commerce present themselves!

The internal Commerce of Victual and Raiment stands thus :

	<i>Millions.</i>
Bread corn, - - -	31½
Barley used in malt, - - -	3
Ditto in distilleries, and for barley and oats used for bread, - - -	12
Cloathing for 15 millions, at 9l. per head,	45
Butcher's meat, - - -	45
Feeding of horses, - - -	20
Ireland (suppose) - - -	12½
	<hr/>
	Millions, 174

Contrast this with our foreign trade, though stated

1 2

at

at fifty millions of imports and exports, yet as many articles are much under-valued, suppose it seventy millions. What proportion would it bear, were the population doubled? Admitting all the grain necessary for our consumption to be grown in Great Britain, the consequence must be, an immediate diminution of foreign commerce, to the amount of five millions, the cost of grain supposed to be annually imported.

Our extended luxury is the primary cause of our vast commercial relations. Our wants give activity to other nations; and to have the means of satisfying these artificial demands, has laid the foundation for our extensive manufactories, unless the latter are exchanged for the produce of other countries. Commerce can never exceed the amount of the export of raw materials and surplus labour *. The circulating medium of any country can never be diminished in any considerable degree, without producing the most disastrous consequences. The fact is, that it varies very little. Spain, and Portugal, who alone deal in gold to supply all their foreign wants, are the poorest countries in Europe, notwithstanding the advantages of their climate, &c. which they possess.

Their Indian treasures have served the purpose of supplying the wants of government, and induced them entirely to overlook the only real source of wealth, the industry and activity of the people. Fortunately

* By surplus labour I would be understood to mean manufactories, fisheries, the carrying trade, as well as the produce of mines, &c.

for Europe the mass of the people of Spain are uncorrupted by wealth and manufactories. Attachment to their native country remains in full force. High principles of honour and independence are felt by all ranks, and the result will be as glorious a struggle for liberty, as was ever made by any nation at any period of the world. But one sentiment can be entertained by any British subject ;—if Spain falls a sacrifice to the enemy of the peace and happiness of Europe, Great Britain cannot long hope to pursue her freedom.

It is possible our external commerce may be diminished, and yet our internal wealth and strength increased.

We possess the staple of various kinds, which are absolutely requisite for other countries to be supplied with, and which they can obtain no where else, such as salt, coals, iron, lead, copper, wool, fish, the carrying trade, &c. these will suffice to procure all that is necessary from other countries, and we have, besides, so long as we can keep possession of our colonies, their surplus produce likewise to barter.

Were the objects of luxury, the produce of other countries, less within the reach of the community at large, I do not know that the ultimate happiness or prosperity of the nation would be affected by it. In the present state of the country, there are supposed to be, of commercial population, four millions three hundred and twenty thousand ;—of agricultural, three millions six hundred and eighty thousand,

Should the circumstances of the times make the agricultural population preponderate as much as it is

now below that of commerce, the physical strength of the nation will gain by the change. The agricultural population being a more hardy, industrious, and sober race, and supported with a fourth less than what is requisite to maintain a manufacturer. A nation of agriculturists will of course be considerably more populous than a manufacturing one, unless they place their reliance for food on foreign countries, in which case they must be a dependent people. The mandates of a foreign despot may overturn such a government, but a nation which depends on its own resources, and has thirty millions of people, has nothing to fear whilst it is true to itself. Such a nation as Great Britain may be, if she pursue her real interest—the cultivation of her land. To be able to make a just estimate of foreign commerce, we ought to take into the account the whole internal trade of the empire, to be added to the hundred and seventy-four millions for necessities; and estimating this at treble the above amount, and calling it five hundred millions, the loss of foreign commerce will be about one-tenth of the trade of the united empire, including our colonies, which may be a third of the whole.

That trade has in general preceded agriculture is certainly true. Till luxury gave birth to wants, a stimulus was required to call men into exertion. Flanders affords a strong example of a country losing its commerce, and yet retaining its population, and superiority in agriculture, to all the rest of Europe. The same quantity of land will not maintain the same number of persons employed in manufactories as in agriculture.

agriculture. This, I conceive, is fully proved by the state of population in China. When speaking of trade, I would always be understood to mean foreign trade. A country cultivated and inhabited to the utmost extent, must have an immense internal traffic. The empire of Great Britain, with a population of thirty million, would have a trade to the amount of 250 million, without any reference to foreign luxuries.

I think little doubt can be entertained, by unprejudiced persons, of the advantage which must result from restoring a due balance between agriculture and commerce. That this can be effected without considerable difficulty, I would by no means insinuate. We have the experience of the last half century of the benefits that resulted from it; and this justifies the wish that the experiment should again be made. The continuance of our national greatness and our commercial prosperity appear absolutely to depend upon it.

I very much question the policy of importation bounties on corn, as a general principle, however necessary under particular circumstances: the policy and wisdom of exportation bounties are ascertained by the experience of eighty years, and appear amongst the many proofs of the wisdom and sagacity of the legislature of those times.

Could the nation be fully apprised of the danger of our situation, and our growing dependence on foreign countries for bread, and reflect on the difficulties we have so recently experienced, as well as the enormous drain of wealth that we have sustained in consequence

of it, they would cheerfully concur in the re-establishment of that system, which not only procured abundance to the kingdom, but enabled it to export grain to the amount of six hundred thousand pounds annually; a sum little short of a million of our present money.

It is doubtless the interest of every member of the community to have grain cheap, and subject to as little fluctuation in price as possible. To have it of British growth appears the most rational way of accomplishing these desirable objects: but this cannot be looked for, or expected, unless the prices of grain be such as will enable it to be grown extensively with a fair prospect of profit to the farmer.

It will scarce be denied, should the spirit of agriculture diffuse itself through every part of the united empire, that Great Britain will very soon be able to supply grain sufficient, not only for her present, but for any increase of population; the inevitable consequence must be, that large tracts which are now cultivated to supply her wants in the North of Europe and America, must be turned to other purposes. Grain beyond the demand for internal consumption, or for certain exportation, will not be grown by any country. It is not a commodity which can be stored and kept without great loss and expense. In case therefore of a year of failure of crops much public calamity would be felt; to prevent which it might, and I conceive would be a matter of good policy to have public stores in various parts of the kingdom. The expense would not exceed the average charge of bounties; but if it even should, no reasonable person would repine at an expense

pense which was to give security for the possession of plenty: such stores might prevent in years of plenty the grain falling too low, or rising too high in times of scarcity.

The prejudice which naturally arises from the predilection with which trade and manufactures have long been viewed in this country, induces the very general belief that the agricultural and commercial interests are so united, that they must stand or fall together; to restore and maintain an equal balance between them appears most conducive to our national prosperity.

As a matter of speculation, I should contend, that the landed interest had ultimately more to apprehend, from the high prices of grain, than the manufacturer; and that any material fluctuation of price does more immediately affect its interest.

It must be allowed, that agricultural wages are regulated in a great measure by the price of the prime necessities of life: the late high prices of grain advanced wages forty per cent. In the years of plenty which have succeeded, it has been found impracticable to reduce them; various other articles having also advanced, over which the fall of grain has no controul.

The labourer's scale of expense has kept pace with his wages, and he is as little able as ever to provide against any additional pressure; so that should an advance take place in grain above the standard of common years (and his employer refuse a still further increase of wages), his family must have recourse to pa-
rochial

rochial relief, which ultimately brings a heavy burden upon the landholder.

Manufactural wages have always been much higher than agricultural, and depend in some degree upon the flourishing state of trade. If the demands slacken, the manufacturer gets his work done at a lower rate rather than the hands should be out of employ, or obliged to seek other situations. The mechanic (earning considerably more wages) can bear a moderate advance upon the prime necessities of life, either by the sacrifice of some superfluities, or by the extension of his hours of work. Neither of these are in the power of the labourer; he has no resources; his confined means admit not of further retrenchment, nor is there any vacant time at his own disposal.

The manufacturer too has a free option whether or no he will continue his trade; if he cannot do it to advantage, he may withdraw his capital, and leave his men to be supported by the landed interest, who are bound to share the last farthing with them: they are in the situation of the mariner—they cannot quit the vessel, but must abide its fate!

Feeling, as I am conscious I do, a strong predilection in favour of agriculture, I am persuaded I do not view the question between that pursuit and agriculture without a powerful prejudice. It may, in some degree, have given a bias to my sentiments: but putting the policy of the measure for a moment out of the question, let us try it upon other grounds, and see if manufactories have contributed to the happiness and comfort of the great body who are engaged in them. What have

have been the effects of high wages? Have they promoted the real interest of those who receive them? Does the manufacturer, with double his earnings, enjoy a greater proportion of the necessaries of life? Are his family better provided for, his children more attended to, and a greater degree of attention bestowed upon their morals and education? I answer decidedly the reverse; and the labourer who earns from thirty to forty pounds is in all respects (I mean generally speaking) better off than the manufacturer who gains from sixty to seventy. The drunkenness and debauchery of the great body of manufacturers justifies every predilection for a profession that produces a greater share of human felicity. In the town before alluded to, there is little thoroughfare, with a population of eight thousand souls. It contains sixty-four public-houses. Now supposing each house to take daily no more than eight shillings, it would be upwards of 11,000*l.* per annum: this would afford, granting a fourth profit, about thirty-six pounds to each house; but what would this be towards their support, when the license, and additional rent on a public-house were deducted. I think a third may be added, and we may estimate the cost of the liquid poison that is swallowed at 1500*l.* Calculating there to be a thousand manufacturers, &c., each man's expenditure would amount to fifteen pounds per man, or nearly six shillings per week. But unfortunately their debauches are not restrained, and too frequently they continue whilst a shilling remains to spend. Domestic strife and misery ensue; the children are neglected; and

and the example set, operates upon them. I think I am justified in stating, there is more misery to be found in this class of men than any other. I refrain from pursuing the detail, which exhibits what every feeling mind must deplore. Much and deeply as I lament to witness the unproductive labour that I see in the place of my own residence, yet I should hesitate before I sanctioned the introduction of any extensive manufactory. I am sensible that the wealth of individuals in the town would be augmented, and that the town itself would be embellished and improved in appearance; but the morals and character of the mass of the people, I am persuaded, would be still more contaminated. I know no instance where this has not been the case; and if this be correct, a price beyond their worth is paid for the improvements that manufactories bring with them.

I trust that, by the prudential and wise measures which have been, and may still be adopted, the interests of agriculture will be promoted, and those of the manufacturer secured upon a more solid basis, than whilst they were suffered to depend on circumstances over which the nation could exercise no controul.

I trust the ardent interest I feel on this subject does not so far mislead my judgment, as to induce me to conceive that practicable, which in fact is only visionary. On the contrary, I flatter myself, that my ideas of the advantages that would result from an extended system of agriculture, and feeding of horses and cattle upon green food and other crops

crops both summer and winter, in order to lessen the necessity of employing so large a portion of our most productive lands in pasture, will have the sanction of those whose coincidence of opinion will give weight to the plan I have adopted. Allowing it were to fall short of the whole advantage I conceive it capable of producing, it may, nevertheless, be attended with much general as well as partial benefit. At all events, I hope to be pardoned for having entered thus largely into the discussion of this subject.

The rapid succession of events which have taken place in the short period since the above was written, has tended to confirm and strengthen the opinions I then entertained, and to place agriculture, and its importance to the country, in a higher point of view than what I had contended for.



ON

SOILING CATTLE.



ON
SOILING CATTLE*.

SIR,

IT is with the greatest deference that I beg the favour of your submitting to the Board of Agriculture, the result of an experiment, made on soiling work-horses and milch-cows, from the month of June to the end of September, in claim of the premium No. 7.

The quantity of ground appropriated to this purpose was twenty-four acres, viz. eighteen of clover and rye-grass, and six of lucerne. I had a pasture also of two acres and a half for turning the cattle into during the night.

The first crop of lucerne was cut previous to the commencement of the experiment, though applied with other food to the feeding of milch cows. Its produce averaged six tons per acre. It is planted in three foot stitches of the third year's growth. The only top-dressings given to it had been coal-ashes and street-rakings, with a small proportion of lime.

The experiment, which I shall have the honour of submitting for the consideration of your Honourable Board, commenced on the first day of June; the stock to be soiled consisted of eighty work-horses;

* Communications to the Board of Agriculture.

ten milch and twenty calving cows; to these last only one stone each of clover was allowed, and the remainder of their food was grass cut from hedges, head-lands, and plantations. Ten stones of clover per day were likewise appropriated to the feeding of pigs, so that the aggregate daily consumption of clover amounted to three hundred and ninety stones, being somewhat more than the produce of a rood of the first crop of clover and rye-grass.

The result of various and repeated trials proved that the weight of the green food, eaten in the twenty-four hours by work-horses, having an allowance of from eight to ten pounds of oats per day, was nearly four stones; but after the few first weeks of soiling, three stones and an half were found sufficient. Milch-cows required on an average four stones' weight of clover and rye-grass, the latter being most predominant. It is likewise most probable that they got some little addition to this quantity on being first turned out into the pasture. The quantity of clover consumed by both horses and cattle depends a great deal upon its age; it is very wasteful, and bad economy to cut it too young. A mixture of rye-grass with clover makes a much less quantity serve, and in a climate so subject to rain as the North of England, the risk is less in making it into hay. Much as the clover crops of Essex are a fair object of envy, they are not one for our imitation. Had the crop been entirely clover, I am, from an experiment of Mr. W. Swinburn, (on whose accuracy I can depend) inclined to believe a greater weight of food would have been required.

Mr.

Mr. Swinburn tried about the first or second of June, what weight of clover a milch-cow would consume, and found she ate sixteen stone in the twenty-four hours.

The spot where the clover grew was flooded by the drainage from the house and offices, and was extremely luxuriant and succulent; it weighed $13\frac{1}{2}$ tons per acre, four times the weight of any crop in the neighbourhood at that time; indeed there was none in the parish fit to cut till the 20th. The clover was so forced that I do not suppose double the number of tons required in a general way to make a ton of hay would have been sufficient. The cow drank no water; the consumption of water by a milch-cow is about eight stone, and very little variation was perceived in their consumption. To suppose this would give a result morally correct would be absurd; but if truth be sought for, it will come pretty near it. If for the purposes of deceiving one's self or others, no doubt this method may suit the purpose. In recommending the practice, I take for granted it is the intention of the party to come as near the truth as possible. The object proposed is to know how to proportion the stock to the food, that has not suffered by the want of that precaution. A considerable deduction for unforeseen losses would (by every practicable farmer) be made in such crops.

The clover and rye-grass yielded nine tons per acre at the first cutting. The method taken to ascertain the weight of the different crops was as follows. Ten square yards (nearly the forty-eighth part of an acre)

were indiscriminately measured out in different parts of the field; and after mowing, the produce of each was accurately weighed; from the gross amount of which an average was taken; the same method was uniformly pursued in every subsequent trial.

I should be wanting towards those who may be inclined to adopt this mode of feeding, were I to omit noticing in a particular manner, an error which I committed, and by which my subsequent crops were greatly lessened. Notwithstanding my having accurately ascertained the daily consumption of food, I had not applied the calculation, so as to determine the period; up to which the clover and rye-grass would supply my stock; and it was the middle of June before I was fully apprized, that not above half of the crop could be consumed in soiling, before a great part of the remainder would become seeded and spoiled. To prevent so serious a loss, I directed eight acres of it to be cut and made into hay; but unfortunately some time elapsed, from the bad state of the weather, before this could be done; and consequently this additional delay greatly injured the quantity of the succeeding crops.

Had one half of the eighteen acres been cut for hay, on the first commencement of the soiling, it would have given so much additional time between the first and second cutting of a great part of the crop, as could not have failed of adding many tons to the weight of the second crop.

From this oversight the greatest part of the second crop was cut before it was sufficiently grown; and it also

also made the last crop so late, on the part which had hay, that the third cutting was not one half the weight of the other parts of the field.

The first crop of clover and rye-grass was finished by the 10th of July ; the second cutting of the lucerne, which succeeded, lasted for about ten days. The average of the whole eighteen acres of clover upon its second cutting, was six tons.

By the 20th of July, all the grass from hedges, head-lands, and plantations was completely exhausted ; and not having a sufficient supply of food for soiling the whole of my stock, the calving-cows were turned out to pasture ; but they had scarcely been out a month, when I had the mortification to find the greater part of them attacked by the garget, which compelled me to have them brought back again. By this means the daily consumption of green food was so much increased, as to give me reason to be apprehensive (it was then early in September), that I should be driven to the necessity of making use of the third crop of clover, before it could have gained a sufficient growth. With a view of lessening the quantity consumed, I caused forty horses to be turned upon the after-math every evening after their work, by which a saving was made of between seventy and eighty stone per day.

There were four tons per acre on the third crop of lucerne, which lasted till the end of September. The clover, on the third cutting, had, upon those parts which had been first cut, eight tons and an half per acre ; but the average of between eight and nine acres, was eight tons. On the remainder, the pro-

duce was not more than from three tons to three and a half.

I had every reason to be highly satisfied with the condition, both of the horses and of the cattle ; and I am sanguine in my opinion, in which I am confirmed by persons of considerable knowledge and experience, not only of the superiority of soiling over grazing, but that the horses could not have performed their work better had they been fed on hard meat.

At all times when the weather was favourable, and the ground dry, the milch-cows were turned out in the evening, and suffered to remain in the pasture during the night, and taken up early in the morning. By pursuing this plan, the garget, or affections of the udder, would be in a great measure, if not entirely, avoided. It is a disorder to which milch-cows in this district are very liable, and from which great losses are sustained, particularly in wet seasons.

The fourth crop of lucerne was cut in November, and afforded nearly two tons per acre. This, together with what remained of the clover, and with the tops of eight acres of carrots (which weighed upwards of three tons and a half per acre) fed my stock till the middle of the month. They were suffered to pick also what they liked from potatoe tops, which were pulled and taken to their pasture. The cattle appeared very partial to the carrot-tops, which are, as far as I could judge, equal to any other species of green crop.

The experience of another year enables me still further to corroborate the advantages of soiling. During the

the whole of the last season, my horses and cattle were fed on clover and cut grass, and the result was equally favourable.

The clover crops of this year having no mixture of rye-grass, weighed on the three cuttings, twenty-four tons.

The first began the 21st of June	-	11 Tons.
Second in August	-	10
Third in October	-	3 $\frac{1}{2}$
		<hr/>
		24 $\frac{1}{2}$
		<hr/>

The spring was highly unfavourable, as was also the long continued drought, in the end of June and July. I had fully expected 30 tons, from the superiority of soil and management over other years. A great deal depends in the latter crop, upon the early cutting of the first. The grass was cut from every hedge, and which answers many good purposes; it effectually destroys all weeds, and puts the clover a great deal further than it would otherwise go. Should gypsum be found to answer as a top-dressing, clover will become a still more valuable crop. A ton of red gypsum, which is equal in strength, though not put for plaster, can be had at 18s. Freight, grinding, &c. suppose 22s. or 40s. per ton, which answers for three acres, or 13s. per acre. A top-dressing of ashes costs 3s.

Mr. Wm. Swinburn received the cup given for soiling by the President of the Workington Agricultural Society, in having eat and fed one acre, the produce of which was 27 tons. He began the 11th of May. It appears it would have been still more advan-

tageous to him, if he had had double the quantity of clover, and cut a part for hay, to have given a greater length of time between the cuttings; by which he would have gained, not only a great additional weight of crop, but also from its being older, the cattle would have consumed less of it, and required water, which from its succulent state was not necessary. The cattle were frequently driven to water during the summer, but seldom or never observed to drink.

From the variety of the food and great increase of my stock, I thought it advisable to conclude the experiment with the month of October. The following estimate of the produce and value of the crops are as correct as they could be made, considering the extent and magnitude of the experiment, and the impossibility of any one person's attending to every part of the consumption.

Sixpence per stone being the lowest price at which hay sells, or 4*l.* per ton—1½*d.* per stone for green food, may be fairly reckoned as rather below the average of a corresponding price. Subjoined is the monthly detail of consumption and cost of feeding, each month being estimated at 30 days :

Monthly Account of Consumption, and Cost of Soiling.

June.

	Stone.	£	s.	d.
By 80 horses at 4 stone each per day, and at 1½ <i>d.</i> per stone	9600	60	0	0
Ten milch-cows at 4 st. each	1200	7	10	0
		<hr/>		
Carry forward	10,800	67	10	0

Brought

On Soiling Cattle.

169

	Stone.	£	s.	d.
Brought forward	10,800	67	10	0
20 calving cows at 1 stone each	600	3	15	0
Pigs, 10 stone per day	303	1	17	6
		<hr/> 73 2 6		

July.

80 horses at 3½ stone per day	8,400	52	10	0
10 milch cows at 4 stone each	1,200	7	10	0
20 calving cows, 1 stone each for				
20 days	400	2	10	0
Pigs, 10 stone per day	300	1	17	6
		<hr/> 64 7 6		

August.

80 horses at 3½ stone each	8,400	52	10	0
10 milch cows 4 stone each	1,200	7	10	0
20 calving cows 2 stone each for				
20 days	800	5	0	0
Pigs 10 stone per day	300	1	17	6
		<hr/> 66 17 6		

September.

40 horses, 3½ stone each	4,200	26	5	0
40 ditto, 1½ ditto	2,100	13	2	6
30 milch cows, 4 stone each	3,600	22	10	0
Pigs, 10 stone per day	300	1	17	6
		<hr/> 63 15 0		

October.

80 horses, 3½ st. each per day	8,400	52	10	0
30 milch cows, 4 stone	3,600	22	10	0
Pigs, 10 stone per day	300	1	17	6
		<hr/> 76 17 6		
Total	55,200			
		<hr/> 345 0 0		

Residue of clover and lucerne consumed in following month

90 0 0

Total 435 0 0

Estimate

Estimate of Crop made upon the Calculation of the Consumption.

10 acres of first cutting of clover and rye-grass, computed at 9 tons per acre, and valued at				<i>Tons.</i>	<i>Stones.</i>	<i>£</i>	<i>s.</i>	<i>d.</i>
1½d., or 1l. per ton	-	90	14460			90	0	0
2d cutting of 18 acres, at 6 tons ditto				108	17280	108	0	0
3d ditto, 9 acres, at 8 tons ditto				72	11520	72	0	0
9 ditto, at 3 tons ditto				27	4320	27	0	0
2d cutting of lucerne, 6 acres, at 5 tons ditto				30	4800	30	0	0
3d of ditto, at 4 tons ditto				24	3840	24	0	0
4th of ditto, at 2 tons ditto				12	1920	12	0	0
				<u>265</u>	<u>58080</u>	<u>363</u>	<u>0</u>	<u>0</u>
Over estimated beyond the supposed consumption				18	2880	18	0	0
				<u>345</u>	<u>55200</u>	<u>345</u>	<u>0</u>	<u>0</u>
Residue of clover, lucerne, and tillage, till Christmas						90	0	0
				<i>£</i>	<i>s.</i>	<i>d.</i>	<u>435</u>	<u>0</u>
This gives a profit on soiling of				14	16	3½		
Ditto on grazing				1	10	4		
Balance of profit in favour of soiling				<u>13</u>	<u>5</u>	<u>11½</u>		

Profit from soiling Twenty-four Acres, with two Acres and a Half of Pasture.

	<i>£</i>	<i>s.</i>	<i>d.</i>
By feeding with clover and lucerne, as above	435	0	0
By 8 acres made into hay	72	0	0
By first crop of lucerne, of 36 tons	36	0	0
Carry forward	<u>543</u>	<u>0</u>	<u>0</u>
Brought			

On Soiling Cattle.

171

	£	s.	d.
Brought forward	543	0	0
Expense of labour and attendance			
two men to cut and lead, at 2s.			
per day, and a horse at 4s. ditto			
for 150 days	£60	0	
A labourer attending cattle for 150			
days	15	0	
	<u>75</u>	0	

MANURE.

4 carts per day, from 80 horses, at			
2s. 3d. per cart	67	10	
2 carts ditto for the 150 days, from			
30 cows and pigs, at 2s. 3d. per			
cart	33	15	
	<u>101</u>	5	
Balance in favour of manure above			
cost of labour		26	5 0
		<u>569</u>	5 0
Rent of 26 acres and a half, at 3l.			
per acre	79	10	
Charge of expense for cultivation,			
at 4l. per acre	96	0	
	<u>175</u>	10	0
		<u>293</u>	15 0

This gives a profit of 14l. 9s. 7d. per acre.

Comparative Statement of Profit on the Grazing of 112 Acres.

	£	s.	d.
The grazing of 80 horses, allowing an acre for			
each horse, at the rate of 4s. per week	352	0	0
Twenty cows, at an acre and a half each, at the rate			
of 4l. 10s. for twenty-two weeks	90	0	0
	<u>442</u>	0	0
Carry forward			
			Brought

	£	s.	d.
Brought forward	442	0	0
Two acres allowed as an equivalent to pigs fed	8	0	0
Winterage of 112 acres, at 10s. per acre	56	0	0
	<hr/>		
	506	0	0
Rent of 112 acres, at 3 <i>l.</i> per acre	336	0	0
	<hr/>		
	170	0	0
	<hr/>		
	£	s.	d.
This allows a profit on grazing of	1	10	4 per acre.
Profit by soiling	14	9	7
	<hr/>		
	12	19	3
	<hr/>		

We must not confine the advantages of soiling to the statement above, considerable as it appears. A most important object, both to the public and to individuals, is the saving of ground; it affords also to individuals the means of keeping large stocks near populous towns, where an extent of pasture could not be procured. The public is benefited by the surplus, land left applicable to the supply of other necessities. In situations where farmers have no adventitious resources of procuring manure, it opens to them a prospect of extended cultivation, which they can obtain by no other means; and it will be allowed, as a still farther and most material recommendation in favour of soiling, that not only the cattle are in better condition, but that they are less liable to accidents.

The want of a weighing machine prevented me last season from making some experiments between soiling and grazing, to ascertain their proportions with respect to fattening of cattle; but I hope another year

to

to be able to try to make some interesting trials on this subject.

Under every circumstance, and in every point of view I have been able to take of the question, it appears the most lucrative and beneficial system which can be followed, and has wherewithal to render it applicable and advantageous to all situations.

The ground upon which the clover and rye-grass grew is a poor clay, with a hard cinder immediately under the surface, which renders it extremely retentive of surface water. If twenty-three tons of clover and rye-grass can be obtained per acre on such land, what increase may not reasonably be expected on ground of an average quality. It was broken up for oats, and a more miserable crop was never seen; next succeeded cabbages and turnips; and in the year following the crops were reversed.

The first crop of turnips was raised from coal ashes. The cabbages were very well manured. The turnips of the second crop followed the cabbage without manure; and both crops were drawn. These successive green-crops were found necessary, to clean and free the ground from twitch-grass. Barley followed them, the ground having had a top-dressing of coal-ashes. It was sown by M'Dougal's drill, and produced 52 saleable Winchester's per acre; the clover, after the Essex method, was top-dressed with coal-ashes, street-rakings, sea-sand, and schistus.

This latter substance (of which abundance is to be obtained in all coal countries) has hitherto, at least in this district, been considered as an enemy to vegetation;
and

and I believe this to have been the first trial made of the schistus in this part of the kingdom. As far as a judgment can be formed of its effects on so short an experience, I think, there is every reason to believe it will answer extremely well.— It is difficult of decomposition, and consequently where it is spread too thickly, it forms a crust, which may be injurious to the growth of grass. As a remedy for this, I have caused a very considerable quantity of it to be mixed with hot lime, which has had the effect of pulverizing it completely ; and I entertain no doubt of its being found a valuable acquisition to the agriculture of those districts where it is to be obtained. I am happy to have this opportunity of acknowledging my obligations to Mr. Davy, of the Royal Institution, for the suggestion of mixing lime with schistus.

The top-dressing of the clover and rye-grass has been again repeated, and from its appearance I fully expected that the crop of the succeeding year would not be inferior to the former one. In this expectation I have been too sanguine, and am disappointed ; much of the clover was destroyed by the late frosts. It cut well the first time ; but came to nothing afterwards, and by no means defrayed the expense of a second top-dressing ; but I hope that the third crop will ensure a good return of wheat by being ploughed in.

I shall now proceed to state the result of a valuable experiment immediately connected with this subject, which was furnished to me by the Bishop of Landaff, whose enlightened and comprehensive mind embraces every science, and whose elucidations carry conviction
upon

upon whatever subject he treats. Twelve hundred and seventy-two grains of the following grasses, and twelve hundred of lucerne, were accurately weighed every day, for the space of a month, till they were found to have no other variation, than what was occasioned by the state of the atmosphere.

1272 grains dart-grass reduced to	469
Ditto of rye-grass	ditto 406
Ditto of rib-grass	ditto 385
Ditto of clover	ditto 324
1200 grains of lucerne	ditto 250

Thus the rye-grass lost in twenty-four hours 365 grains; and the lucerne in the same space of time 235 grains.

This experiment points out the great advantage of applying clover and lucerne for soiling, as their loss is considerably greater in making into hay, than that of any other species of grass.

Before concluding, I beg leave to state the result of another experiment on a crop but very partially cultivated, the profits and advantages of which are, in my estimation, greater than any other crop; I mean carrots. This admirable root has, upon repeated and very extensive trials for the last three years, been found to answer most perfectly as a part substitute for oats. Where ten pounds of oats are given per day, four pounds may be taken away, and their place supplied by five pounds of carrots. This has been practised in the feeding of eighty horses for the last three years,

years, with the most complete success ; and the health and condition of the horses allowed to be improved by the exchange.

In order to afford the data for estimating the profit of carrots, I shall add the actual expense of the cultivation of an acre. It must be observed, however, that the ground, to which the expense refers, is by no means such as would, in general estimation, be thought fitted for the growth of carrots. The expense attending the preparation of such ground is consequently much greater, than would be requisite in soils more genial to their growth ; and probably the return is greatly inferior also.

Expense on the Cultivation of an Acre of Carrots.

	£	s.	d.
Winter fallow with water-furrowing -	0	10	6
Deep ploughing with four horses -	1	1	0
Twice ploughing subsequent to ridging up, with harrowing and picking -	1	2	0
Ridging up with double mould board plough - - - - -	0	8	0
Seed 1 lb. 5s. ; hand sowing on three-foot stitches, 5s. ; and drawing the trenches, 5s. - - - - -	0	15	0
Three times hand weeding -	1	10	0
Six times working with ploughs and har- rows during the summer -	2	5	0
	<hr/>		
Carry forward	7	15	0
	Brought		

On Soiling Cattle.

177

	£.	s.	d.
Brought forward,	7	11	6
Cutting tops off, 10s. and leading, 15s.	1	5	0
Taking up with plough, 8s.; leading, 1l. 10s.	1	18	0
Cutting off the vegetative part and piling, 15s.	0	15	0
20 carts of ashes, at 3s.; scaling, 5s.	3	5	0
	<hr/>		
	£.	14	14 6
	<hr/>		

Value of Carrots.

3 tons 137 stone of tops, at 1d.	£.	s.	d.
per stone	2	11	5
12½ tons, or 2000 stone of car- rots, at 6d.	50	0	0
	<hr/>		
	52	11	5
Deduct expense of cultivation	14	14	6
	<hr/>		
Profit per acre	£.	37	16 11
	<hr/>		

Comparative Cost of feeding between Oats and Carrots.

4 lb. per day of oats for eighty horses, at the rate of 1s. 3d. per stone, or 22 stone and 2 lb.	£.	s.	d.
	1	8	3
N	Brought		

	£.	s.	d.
Brought forward,	1	8	3
80 horses with 5 lb. of carrots per day, at 6d. per stone, or	£.	s.	d.
28 stone 8 lb.	0	14	3
Expense of cutting and washing	0	2	0
		<hr/>	0 16 3
Gain on feeding with carrots	-		0 12 0
			<hr/>

Carrots being taken at 6d. and oats at 1s. 3d. per stone.

I have found the carrots to keep extremely well, by cutting off the vegetative part, and piling them in rows one foot and a half broad, and six feet high, and taking care to admit a sufficiency of air, till the fermentation is over.

The extreme mildness and moisture of last winter occasioned a great loss in my carrots towards the latter end of February; I beg therefore to be understood as speaking with considerable diffidence as to my method of keeping them, though it answered perfectly well the two preceding seasons. I have constructed apertures in the roofs of my carrot and potatoe houses, which give free vent to the fermentation, and are easily shut against rain and frost. I have no doubt it will be found to contribute greatly to their keeping, and is done at a trifling expense.

I have practised one method in sowing the seed, which I do not know to be usual. The seed is mixed with moistened sand a week or ten days previous to using,

using, and kept in some warm situation, by which it is in a state of vegetation when sown. This gives the carrot the start of the weeds, and also allows of longer time for preparing the ground.

The advantages derived from this crop are so great, that twenty-two acres are prepared for the ensuing year, with this difference only, that the deep ploughing has been given for the winter's fallow. An acre of carrots supplies an equal quantity of food for working horses, as sixteen to twenty acres of oats. My weekly saving of oats, by the use of carrots, exceeds an hundred Winchesters.

Accompanying this are certificates and vouchers for the correctness of the above statement, should my claim be so fortunate as to meet with success.

I have the honour to be, Sir,

Your most obedient servant,

J. C. CURWEN.

December 22, 1806.

P. S. I here add the price of labour, to afford an opportunity of calculating the expense, when compared with other districts.

Day-labourers from 10s. 6d. to 12s. per week.

In harvest time from 15s. to 18s. do. without any kind of allowance,

Women 1s. per day; but in harvest from 7s. 6d. to 9s. without any allowance.

Good ploughmen from 14s. to 15s. per week.

Hind servants, with board, from 8 guineas to 10 guineas for the half year.

Women do. from 5 to 6 guineas.

One horse, cart, and driver, from 5s. to 6s. per day.

The cut grass from hedges and plantations cost me under 1d. per stone. Besides the advantages of feeding, it was the means of destroying all weeds, an object of no inconsiderable importance.

Workington, Dec. 24, 1806.

"We, JOHN DICKSON, farrier, and THOMAS MOOR, groom, to John C. Curwen, Esq. do certify that the horses under our care have improved in their condition since the carrot feeding commenced. That it is our opinion, when from eight to twelve pounds of oats are allowed to a work horse per day according to its employment, four pounds may be omitted for five pounds of carrots, and the spirit, condition, and ability of the horse, to perform his work, improved by the same.

From the experience of three years, I, THOMAS MOOR, can speak with confidence of the advantages of carrot feeding, and that JOHN ELLIOT, former farrier to John C. Curwen, Esq. was of the same opinion.

"JOHN DICKSON.

"THOMAS MOOR."

Workington, Dec. 24, 1806.

"I, ISAAC KENDAL, bailiff to J. C. Curwen, Esq. do certify that I have carefully examined the report upon

upon soiling, and the several statements therein made relative to stock-feeding and produce, and I believe them to be perfectly correct. I also certify for the admirable condition of horses and cattle: and that it is my belief, the estimate of gain is rather under than over stated; that a much greater quantity of manure might have been made, had there been a sufficiency of straw allowed.

“ISAAC KENDAL.”

The following is an Extract of a Letter from a most respectable Yeoman in one of the most mountainous Districts in Cumberland.

Grahmsonset, Bewcastle, January 2, 1808.

SIR,

When at Carlisle, I called upon Mr. Jackson for the Agricultural Report, which he had not then received; but was so kind as to put into my hands your communication to the Board of Agriculture on soiling cattle; and from the manner in which the experiment is stated, it is obvious, that it is a much more economical and profitable method of feeding. Clover will go much farther than turning the cattle upon it. For some years past I have cut my first crop of clover for hay when scarcely ripe; the second crop being much better if the first is cut before the power of vegetation is exhausted; and having a bad cow pasture, I commenced a kind of soiling cows, four calves, three pigs, and a horse, in the last week of July, or so,

and find that between two and three acres will nearly support them till the end of October. By this means I save great part of my fog (or aftermath) as winter feed for sheep, and keep a cow or two more than I could otherwise do. The practice is likely to become general in our neighbourhood, especially on small farms.

I am, Sir,

Your most obedient humble servant,

JOHN DODGSON.

I could not but feel highly gratified on finding the spirit of improvement which is manifesting itself in one of the wildest districts in England. If practised with success in such a quarter, what return might not be fairly expected in more favoured situations.

The following experiments made in the course of last summer, afford very satisfactory grounds for believing that soiling for fat will turn out highly advantageous, and greatly exceed, both in profit and increase, any thing which can be attained by grazing. In a very few years there will scarce be a farmer in the county of Devon who will not practise it in some degree. The progress of soiling has been much more rapid than could have been believed. When I first stated, three years

years ago, the value of an acre of clover to be from 20*l.* to 25*l.* I obtained little credit for it; yet in the course of the last year, Mr. Ormandy, a farmer in Low Furness, on being asked what he conceived the value of an acre of clover which he had cut and soiled, answered, he thought it worth 20*l.* at least.

	£.	s.	d.
He had soiled eight horses 6 weeks on the first cutting, at 4 <i>s.</i> per week	-	9	12 0
Nine do. on the second	-	10	16 0
		<hr/>	
		20	8 0

And he expected to be able to cut it a third time. With such an evidence, I shall close this account, trusting it contains ample proof to satisfy any reasonable person of the great and important benefit to be derived from the practice.

Detail of an Experiment in Soiling and Grazing, made at the Schoose Farm, 1808, and reported to the Workington Agricultural Society, by the President.

No object is of more importance to the farmer than the choice of his feeding and wintering stock; as much of the profit of his green crop depends upon the facility with which they fatten, and are kept in condition. The greater the stock which can be maintained,

tained, the more manure will be made. If there be one breed of cattle which will, with less consumption of food, gain more than another, that is the stock every farmer would wish to have. Though no proposition can be more self-evident than this, nor calculated to command a more general and ready assent, yet, strange as it may appear, nothing hitherto has been less attended to. There is not one valuable experiment extant upon the subject; such as have been made are given in so vague and crude a form, as to preclude any practical information being drawn from them.

Amongst the many causes of regret for the loss of that valuable friend to the public, and to the agriculture of the country, the late Duke of Bedford, this may be reckoned one. His ardent and indefatigable mind was actively employed on this important subject; and had he lived he would have ascertained the matter, and by a series of judicious experiments, would have left no doubt on a point of such moment.

Experiments to be useful, require the whole detail to be given. The consumption of food lessens as the animal increases in fatness; it is therefore impossible to form any just calculation from a portion only of the time of feeding:—repeated statements of weight are necessary to determine the progressive advancement, and to mark the period when there is no longer a gain adequate to the food consumed. Advance of markets may counterbalance, and make up the loss on this head; no particular rule therefore can be fixed, as to the time of selling; but every one must judge from
the

the particular circumstances of the case. It is of great consequence to the farmer to know the relative worth of his respective crops, and what advance he can make upon each, in order to decide upon their value.

These subjects were first suggested to me by that spirited and intelligent farmer, Mr. Bates of Halton-Castle; and the importance of them appears in my view to increase, from the little I have done in the course of this summer, with a view of determining the comparative increase of weight that may be obtained by soiling and grazing. The little I have learnt augments my desire of proceeding: and I flatter myself the experiment I have undertaken, and of which you have seen the commencement, will tend to throw some light upon the subject. In the mean-time I beg leave to lay before the Society, the result of the trial in soiling and grazing for fat.

In all experiments there is much attention requisite not to suffer oneself to be deceived; for whether the public be misled intentionally, or for want of proper caution and care, the effects are the same, though the motives may be widely different: the strongest reprehension is due to error, from whatever cause it proceeds.

The experiment was made between two Kyloes: the one was ten or twelve years old, and had had a number of calves; the other grazed was four years old, having had no calves. The advantage was supposed to be wholly in favour of the younger animal. It appears reasonable that the period most favourable for fattening should be as soon as the animal had arrived to its full growth.

Experiment

Experiment made to determine the respective increase made by Soiling and Grazing, commencing the 14th of May, and concluding the 1st of October, 1808, being a period of 140 days.

Soiled Kylo weighed (*first weight*) 66st.

Grazed Kylo weighed (*ditto*) 57.

KYLO SOILED.

Date.—May 14 | June 27 | Aug. 4 | Aug. 23 | Sept. 6 | Oct. 1
Weight.—66st. | 74st. | 74st. | 77st. | 78½st. | 82st.

No.	No. of days between ch. weighg.	Increase in ch. period.	Avg. gain of the whl. per day.
		st.	lb. oz.
1	44	8	2 8
2	9	0	0 0
3	29	3	1 4
4	19	1½	1 1½
5	14	1½	1 8
6	25	2	1 2
	140	16	1 9¾

A considerable deduction must be made from the apparent gain of the second period of weighing; I should suppose one might strike off all above what appeared to be the average gain upon the third period of weighing, when the animal may be conceived to have taken fairly to feeding. There appears the strongest grounds for believing that it is weight of entrails, not of carcass; as the gain of the first fortnight bears no proportion to any subsequent one. When confined, the animal digests his food less rapidly: upon this principle I strike off 3st. 13lb. in valuing the soiled kylo; and after the same rate in the estimate of the long-horned and other soiled kyloes.

Food consumed.

No.	periods days.	Daily st.	Total. st.
1	40	7	280
2	30	5	150
3	70	4½	315
	140		745

Increased wt. of soil'd

kylo, taken at 12st. £ s. d.

1lb. at 4s. 8d. . 2 16 4¾

2d. per lb. between

lean value and fat 7 14 0 £ s. d.

10 10 4¾

745st. clover, at 1d. 3 2 1

280lb. oil-cake, at 1d. 1 3 4

30st. of chaff . 0 2 6

4 7 11

£. 6 2 5¾

All the animals soiled drank about two gallons of water per day, except when the clover was cut and brought in wet.

KYLO

KYLO GRAZED.

Days grazed.	Total increase.	Increase per day.	Increase of carcass (loss taken at 2st.) 7st. 9lb. £ s. d. at 4s. 8d. per st. 1 15 8 2d. per lb. on first weight 6 13 0 £ s. d. 1 acre of grass (I think insufficient) 4 4 0
140	9st. 9½oz.	15½oz.	4 4 8

The kylo grazed consumed the 5th of a moderate acre of clover, but not more than the 7th of land worth 4l. per acre. The soiled kylo pays nearly 3d. per stone for the clover consumed, or after the rate of 33l. 12s. 6d. for an acre of 23½ tons; the grazed kylo pays 8l. 8s. 10d. per acre. The manure in soiling is supposed equal, at least to the labour: what allowance, if any, should be made for the manure scattered by grazing, I am not prepared to say. The grazed kylo was thrown considerably back by the red water: the soiled kylo lost nine days by being removed into too warm a shed. It seldom happens dissimilar objects can be brought into perfect comparison. I shall fairly state the facts, drawing the conclusions that strike me; leaving every one to exercise his own judgment, and either to receive or reject them.

Result of slaughtering the two Kyloes.

SOILED.

When taken from food, Weighed. . 82st.	24 h. fasting, 75st. 8lb.	72 h. fasting, 69st. 9lb.	total loss bef. killing, 12st. 5lb.
	st. lb.		
Carcass 45 7		Supposing the calculation of weight to be made, as I believe is the case, when the beast has been fasted and in a state proper to slaughter, the kylo will have done well. st. lb.	
Loose fat 7 3		Carcass 52 10	
Blood 2 3		Offal 16 13	
Feet 0 13			
Paunch, water, &c. 7 1			
Head, heart, &c. . 2 6			
Hide 4 4			
	69 9		69 - 9

This Kylo leaves a profit, per day, of 10½d.
Grazed. 7¾d.

GRAZED.

Weight on food, 66st. 9½lb.	After being fasted, 55st. 9lb.	Total loss, 11st. ½lb.
	st. lb. oz.	st. lb.
Carcass 36 8 8		Carcass 40 10
Loose fat 4 1 8		Offal 14 13
Hide and Offal 14 13 0		
	55 9 0	55 9

A further

A further experiment was made with a long-horned Cow, eight or nine years old, which had had several calves.

Date. — } July 11, | August 3, | Sept. 7, | Oct. 1, | Oct. 17,
Weight. } 75 st. | 84 st. | 86 st. 7 lb. | 88 st. | 89 st. 5 lb.

No.	No. of days between weighing	Increase in each period.		Avg. gain of the whole per day.
		st. lb.	lb. oz.	
1	23	9 0	5 7	
2	35	2 7	1 0	
3	24	1 7	14	
4	18	1 5	1 0	
100		14 5	2 4	

Statement of the Expense and Gain.

Increased weight (deducting 7 st. 1 lb.)	5 st. £ s. d.
13 lb. at 4 s. 8 d.	1 7 8
2 d. per lb. between lean value and fat.	8 15 0
	10 2 8
764 st. clover, at 1 d.	3 3 8
300 lb. oil-cake, at 1 d.	1 5 0
50 st. chaff, at 1 d. . .	0 4 2
	4 12 10
	5 9 10

Food consumed.

No.	Periods	Daily.	Total.
	days.	st.	st.
1	32	9	288
2	50	7	350
3	18	7	126
100		23	764

The first period of increase goes strongly to establish the principle I have adopted, as to estimating the value of the increased weight from the third period of weighing.

Result of slaughtering the long horned Cow.

Weight from food, 89 st. 5 lb. | When killed, 80 st. | Total loss, 9 st. 5 lb.

	st. lb.		st. lb.
Carcass.....	46 5	Carcass.....	49 12
Loose fat.....	3 7	Offal.....	30 2
Blood.....	3 0		80 0
Offal.....	23 2		
Hide.....	4 0		
	80 0	Profit per day....	1 s. 1 d.

It

It is evident the estimated value of the carcass of the long-horned is too high: the kylo sells 1*d.* per *lb.* at least dearer. The original weight gives the result of profit, which is little short of the kylo; when there is no comparison in offal to carcass. The long-horned consumed a greater weight of food in 100 days, than the kylo did in 140.

The progress of the experiments created that degree of interest that made me anxious to proceed further: in consequence of which, I caused six very moderate three-years-old Highlanders to be tied up, the 27th of June, and fed them for the greatest part of the time with grass, cut from hedges, plantations, and walks, considered of little if any value. This experiment is highly satisfactory;—how much food of this kind does every farmer waste! and which is worse, suffers it to seed and multiply weeds! My first object in cutting my hedges was, to destroy weeds: the appropriation of a great deal of the worst grass to any beneficial purpose, was an afterthought. For the last month they have been fed with carrot and turnip-tops. I had no straw to spare, yet they have maintained their condition: one that appears to have failed took the sore-mouth, but has killed extremely well.

Calculation of the Increase upon the six Highlanders.

	June 27	July 6	Aug. 3	Aug. 23	Sept. 6	Oct. 1	Nov. 9
	st.	st.	st.	st.	st.	st.	st.
1	35 ..	39 ..	43 ..	44 ..	45 ..	48 ..	47
2	36 ..	41 ..	44 ..	48½	49½	50 ..	51
3	37 ..	41 ..	44 ..	46½	48½	48 ..	47½
4	38 ..	42 ..	45 ..	47 ..	48 ..	50½	52
5	38 ..	41 ..	45 ..	46½	47½	49½	50
6	45 ..	31 ..	41½	44 ..	45 ..	46 ..	46½
	219 ..	242 ..	263 ..	276½	283 ..	292 ..	294

Estimated Gain of the six Highlanders.

Periods	Increase in each.	Daily Increase.	Increase of kylo (loss taken at 2st. 5lb.)	9st. £. s. d.
days.	st. lb.	lb. oz.	12lb. at 4s. 8d.	2 2 0
9	23 7	6 1½	2d. per lb. on first wt.	4 1 8
30	20 7	1 7½		6 3 8
18	13 7	1 12	135st. of green food. .	1 7 6
14	6 7	1 3	50st. of steamed chaff. .	0 4 2
25	9 0	0 13	50lb. of oil-cake,	0 4 2
39	2 0	0 2		1 15 10
135	74 0	1 4½		4 7 9

Cost of feeding one Highlander.

Days.	Daily.	Total.	at ½d. 1l. 7s. 6d
135	4½st.	607st	

Weight of Kylo.

From fd.	Before kill.	Loss.
46½st.	39st. 6lb.	7st. 1lb.

Slaughtered Weight.

	st. lb.		st. lb.
Carcass.....	23 4	Carcass.....	26 6
Loose fat	3 2	Offal.....	13 0
Hide.....	3 5		39 6
Offal.....	9 9		
	39 6	Nearly pays, per day, 8d.	

Whatever

Whatever difference of opinion may arise as to the mode of calculation and the dates assumed, I conceive the advantages of soiling to be so apparent that no one can question them, either as applied to feeding horses, milch-cows, or to fattening. The communications received from various quarters fully prove the rapid progress it has already made. The benefits that will result from soiling to the general state of cultivation, will be greater than I should think it prudent to state (under all the indulgences I might expect) to the full extent of my opinion.

In concluding the labours of the year, I feel fully justified in anticipating the most rapid improvements in the agriculture of the county. To alter opinions, and to effect a change in habits and practice, are tasks of infinite difficulty: but the moment men are disposed to be convinced, the change is rapid beyond belief; such I believe to be the state of the public mind, as far as I can judge. May every thing which can tend to the general and individual happiness of the county have a prosperous issue.

The following abstracts for eight years, will shew the progressive improvement in the produce of the Schoose Farm. The accounts are posted every fortnight in the same manner, so that the result of the whole operations are brought into one point of view.

Large as the produce may appear from 520 acres, I think it may still be greatly augmented.

To

To what extent the rotation of crops may be carried where manure is to be procured, has not, I conceive, been hitherto ascertained by any thing which has yet been done in any part of the kingdom. I cannot see the extensive pastures which surround London and other great towns, without lamenting they are not turned to better account. These are situations where garden husbandry ought to be carried to its utmost perfection; which would augment the produce seven fold at least beyond what it is, and give employment to a number of additional hands. The best example of this is to be seen near Biggleswade.

Workington-Hall, Jan. 1808:

HONOURED SIR,

It appears from the accounts of the years 1800 and 1801, there is an extraordinary difference in their produce, which may in some measure be accounted for in the fluctuation of the price of grain. Oats were in a great measure bought in the year 1800, at a very high price; and valued to the farm, at the commencement of 1801, at 24*s.* the bushel, and not worth at the end of it more than 10*s.* per bushel; other grain in proportion. Hay was this year (1801) also a very failing crop, and said to be 300 tons short of what an average year would have produced. Some items, to the amount of 118 tons, had not been put into the stock.

I am, honoured Sir,

Your obedient servant,

WM. SW. NBURN.

Workington, Dec. 30, 1807.

Schoose

SCHOOSE FARM ACCOUNTS.

The following farm accounts of the Schoose are unavoidably blended with work done for the collieries, so that they afford no fair data to judge what would be the profits of the arm under other circumstances. They exhibit, however, a faithful account of the produce, the increase of which is striking. Taxes of all kinds amount to 150*l. per annum*. Great and most essential improvements have been made, leaving at the same time from one to two rents—from this the taxes must be taken; and likewise a farther reduction for the interest upon buildings, which are upon a larger scale than are necessary. In this part of my management I should not recommend others to follow my example. The Flemish system of farming will require more conveniences for feeding cattle than the present mode. Truth has in all instances been the object I have strictly aimed at—and I trust I have in no instance shrunk from the disclosure of it, though it might be at the expense of self-condemnation. The accounts are vouched by my agent as they pass through my office, without my having any interference with them, so fearful have I been of deceiving myself.

Schoose Farm, year ending 31st Dec. 1800.

DISBURSEMENTS..	£.	s.	d.
To money disbursed as per Accounts,.....	6523	16	5
To Stock, 1st Jan. 1800,.....	2033	12	3
To Rent and Profits,.....	1930	7	8½
	10487	6	4½

RECEIPTS.

By sundry Receipts for Stock sold and Colliery			
Horses' work,.....	7195	6	4½
By value of Stock, Jan. 1st, 1801,.....	3292	10	0
	10487	16	4½

Schoose Farm, year ending 31st Dec. 1801.

DISBURSEMENTS.	£.	s.	d.
To Money disbursed,.....	7322	14	9
To Stock, 1st Jan. 1801,.....	3292	10	0
	10615	4	9

RECEIPTS:

By sundry Receipts for Stock sold and Horses'			
work,.....	6088	7	0½
By Stock, Jan. 1, 1803,.....	3800	7	0
By Loss,.....	726	17	8½
	10615	4	9

GENERAL

A 1802.

[Table I. to face p. 194.]

Fort-nights.	Straw.	Oats.	Peas.		Totals.
	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>		<i>l. s. d.</i>
1	—	—	—	Food, &c.	283 3 2
15	96 13 9	595 5 5	6 0	Light, &c.	1929 15 8½
26	—	—	—	Horses' Wages	1840 18 6½
					3753 17 5½

Fort-nights.	Straw.	Oats.	Pigs. Ing.	Horses' Work at the Colliery.		Totals.
	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>		<i>l. s. d.</i>
1	—	—	—	—	—	—
15	12 18 0	87 15 6	59 9 5	0 2862 10 5	Stock Sold,	2420 2 9
26	—	—	—	—	Colliery Horses' Work,	2862 10 5
						5282 13 2

To Stc.....2420 2 9

To W.....2862 10 5

To St.....4460 11 6

To Pr

£. 9743 4 8

Dec

WM. SWINBURN.

Schoose Farm, 1803.

Wheat.	Barley.	Sheep.	Iron, Wood, and Leather	Labourers' Wages.	Totals.
s. d.	l. s. d.	l. s. d.	l. s. d.	l. s. d.	l. s. d.
12 0½	281 15 6	51 9 0	362 10 5	—	2790 7 1½
—	—	—	—	2112 17 7½	2112 17 7½
					4903 4 9½

rm, 1803.

Wheat.	Horses.	Barley.	Work at Collieries by Horses.	Totals.
s. d.	l. s. d.	l. s. d.	l. s. d.	l. s. d.
14 7	497 16 6	177 12 8	27 16 0	—
—	—	—	—	4840 6 6½
			3314 16 9½	3314 16 9½
				5155 3 4

By Credit do.

By Sales,1840 6 6½

By Horses' Work,3314 16 9½

5155 3 4

By Stock, Jan. 1, 1804,5244 9 6

£.10399 12 10

WM. SWINBURN.

10615 4 9

GENERAL

[Table II.

Fort-nights.	Potatoes.	Head-land.	Labour-ers' Wages.	Totals.
	<i>l. s. d.</i>	<i>l. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>
1	233 11 5	100		
5	—	7		3849 10 7
6	—		2197 8 5	2197 8 5
	233 11 5	100		
		7	2197 8 5	6046 19 0

Fort-nights.	£	Totals.
	<i>l. s. d.</i>	<i>l. s. d.</i>
1		
15	52	
26		1901 0 0
	4	291 16 8½
52		6192 16 8½

0
8½

8½
0
8½

SWINBURN,

le IV.

ught at	Totals.
Straw.	<i>l. s. d.</i>
	237 2 9½
	38 17 4
<i>d. l. s.</i>	36 19 0½
	3 18 6
	232 19 2
	3 18 6
	7

the Sch	Barley
	<i>d. l. s.</i>
	13 3 168 12
	—
	13 3 168 12

10.

10

the Schoose Farm, 1805.

Hay.			Sheep.			Cattle & Milch Cows.			Insurance.			Potatoes.			Labourers' Wages.			Iron, Wood, & Leather.			Totals.	
l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.
63	12	15	0	93	19	0	5	95	11	0	16	10	0	180	5	2	—	641	8	0	3601	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2276	14	6	—	—	—	2276	1
63	12	15	0	93	19	0	5	95	11	0	16	10	0	180	5	2	2276	14	6	641	8	0
																					5877	1

oose Farm, 1805.

Oats.			Poultry.			Potatoes			Oil-cake.			Grazing.			Work by Horses at Colliery, &c.			Totals.			
d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.
6	59	18	0	36	8	5	5	9	2	20	11	1	33	15	6	—	—	—	2120	3	8
	—			—			—			—			—			3996	16	6	3996	16	6
6	59	18	0	36	8	5	5	9	2	20	11	1	33	15	6	3996	16	6	6117	0	2

By Sale and Produce..... 2120 3 8
 By Work with Horses 3996 16 6½
 By Stock, Jan. 3, 1806..... 8091 17 9

£.14208 17 11½

WM. SWINBURN.

10615 4 9

GENERAL

[Table III. de IV.

Horses.	Cattle.	Lime.	Bran.	Soapers' Waste.	Labourers' Wages.	Leather, Iron, and Wood.	Totals.	Totals.
<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>
647 18 6	518 13 6	101 3 10	44 12 6	49 5 8	—	—	4105 0 3	237 2 9
—	—	—	—	—	—	783 3 4	783 3 4	38 17 4
—	—	—	—	—	2785 1 8	—	2785 1 8	36 19 0
—	—	—	—	—	—	—	7673 5 3	232 19 2

07

Fort-nights.	C. G.	ultry.	Sundries.	Colliery Work.	Totals.
<i>l.</i>	<i>l.</i>	<i>s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>
1	—	—	—	—	—
5	75	—	—	—	—
10	—	8 10	63 10 11	—	3125 2 1
20	—	—	—	—	—
26	—	—	—	—	—
—	—	—	—	4237 16 10	4237 16 10
—	—	—	—	—	7362 18 11

.. 3125 2 1
 . 4237 16 10
 —————
 . 7362 18 11
 10258 18 0

17621 16 11

WM. SWINBURN.

w
o

oose Farm, 1807.

Manure, papers, Waste.	Straw.	Bran.	Ploughs, &c.	Hay.	Saddlers' Ware and Husbandry Utensils.	Labour- ers' Wages.	Totals.
<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>
58 16 2	141 13 9	33 16 4	89 19 6	588 17 5	—	—	5732 14 1½
—	—	—	—	—	549 14 0	—	549 14 0
—	—	—	—	—	—	3084 17 2½	3084 17 2½
58 16 2	141 13 9	33 16 4	89 19 6	588 17 5	549 14 0	3084 17 2½	9367 5 4

; or Stock sold.

Dairy, &c.	Sundry gene- ral Charges.	Oil-cake.	Carts to Moor- Close Farm.	Horses' Work.	Total.
<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>
73 19 4	64 7 0	20 12 10	60 0 0	38 19 6	4970 1 4½
—	—	—	—	—	—
—	—	—	—	5890 6 2	5890 6 2
73 19 4	64 7 0	20 12 10	60 0 0	5929 5 8	10860 7 6½

Stock sold as above..... 4970 1 4½

Horses' Work, as per..... 5890 6 2

10860 7 6½

Stock per Valuation, Dec. 31, 1807.... 9647 4 0

£ 20507 11 6½

worth 50*l.* Potatoe crop, 68 acres, fell one half short. 21 acres of carrots were un-
usable of any that has been known for many years past. Such disappointments are

WM. SWINBURN,

GENERAL

An Account [Table IV.]

rt- its.	Horses.	Shee p.	Cattle.	Wheat.	Oats.	Hay.	Straw	ers' es.	Totals.
	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>
1	432 9 0	59 10 0	584 17 6	937 9 2	2308 16 6½	225 19 8	94 16 1	d.	5687 2 9½
13	—	—	—	—	—	—	—	—	688 17 4
26	—	—	—	—	—	—	—	9 0½	3486 19 0½
	432 9 0	59 10 0	584 17 6	937 9 2	2308 16 6½	225 19 8	94 16 1	9 0½	9862 19 2

Receipts

Fort- nights.	Horses.	Cattle.	Pork and Pigs.	Sheep.	Wheat.
	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s.</i>
1	729 17 6	709 13 2	57 8 9	45 11 9	1225 18
13	—	—	—	—	—
26	—	—	—	—	—
	729 17 6	709 13 2	57 8 9	45 11 9	1225 18

Stock per valuation, Dec. 31, 1807,.....9647 4 0

Out of which deduct Straw, not being taken

into Stock, Dec. 31, 1808.....900 0 0

8

Stock bought in the year 1808, as above.....6

Labourers' Wages..... ditto9

186

To Rent and Profits.....15

201

On Soiling Cattle.

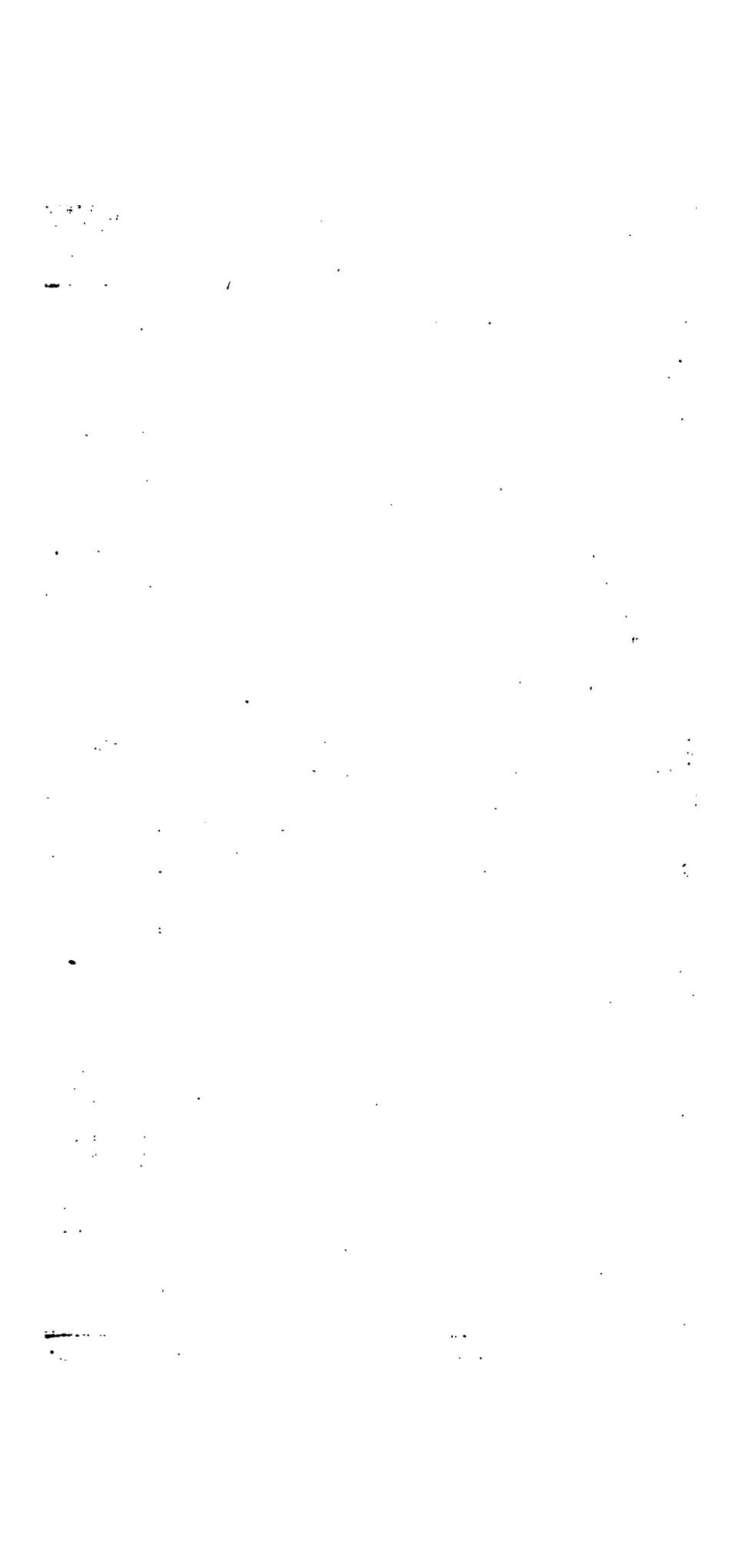
Straw				
Oilcake				
Carrots				
Potatoes				
Fat and lard				
Ploughs				
Harrows				
Drills				
Carts				
Waggons				
Other Husbandry Utensils ...				
Horses, employed by				

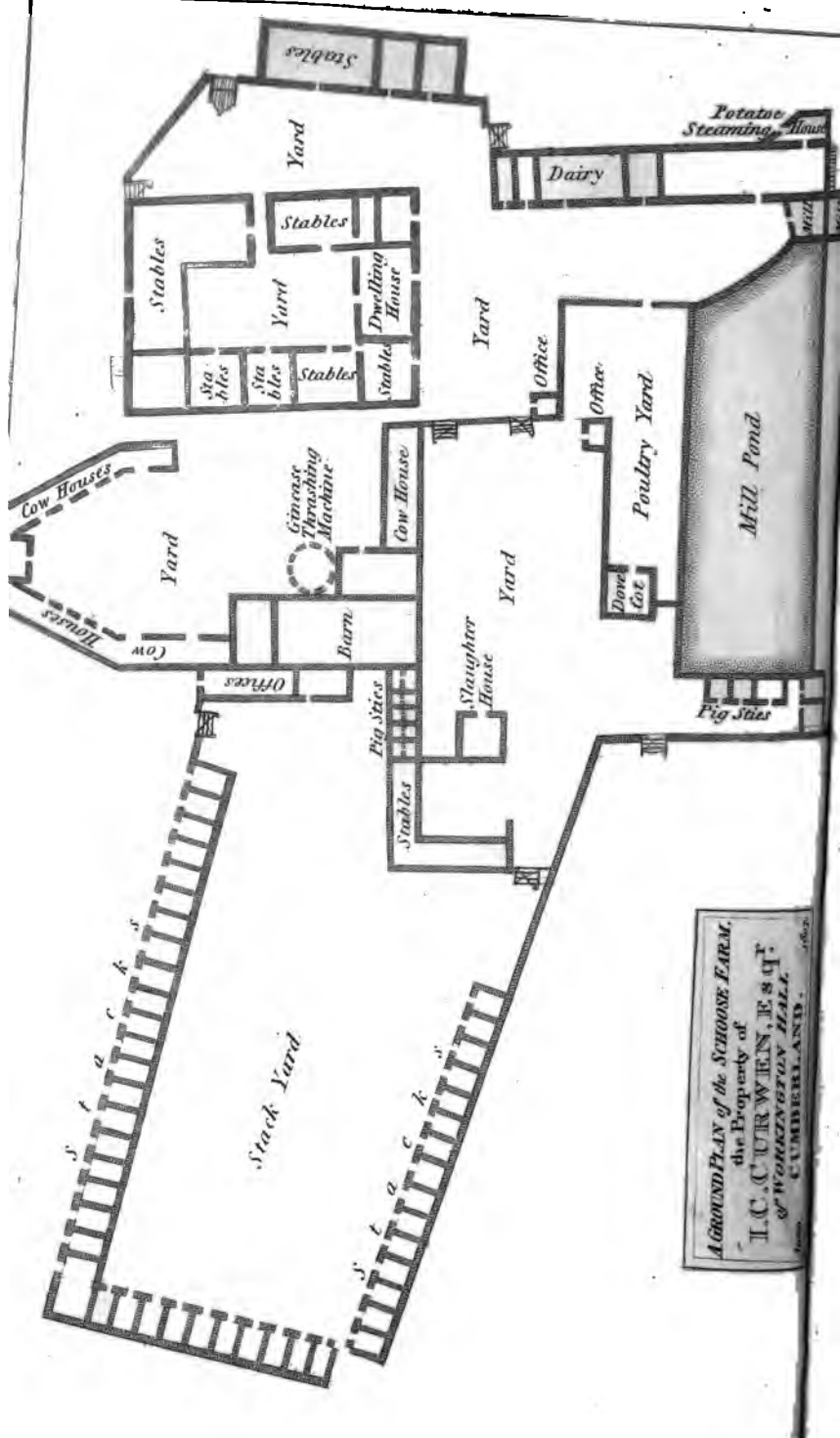
WM. SWINBURN,

GENERAL



proportion as example is more forcibly illustrative of imperfect practice than the most cogent reasoning, I present myself to the attention of my readers : and in detailing the causes which led me, at a late period of my life, to undertake the superintendence of my own house-farm, after having neglected it for upwards of 20 years, I am desirous of benefiting those, who from choice or other motives may, like myself, be induced to a constant residence in the country. The apprehensions generally entertained in the year 1801, from the failure of the hay crops, and the difficulties likely to arise in the providing food for any considerable number of horses, roused me from my indifference, and impelled me to dedicate my most serious attention to the subject. The result of my inquiry was the adoption of the plan for steaming potatoes, mixed with cut straw, as a substitute for hay. Hence an alternative which I had every reason to consider as likely to be productive of very serious loss, proved most unexpectedly a source of profit, and afforded me, what was not within my expectation, a fund of pleasurable amusement. For above 20 years I had confided the management of my farm, which was of some magnitude, entirely to the direction of a ~~butler~~ butler, with the single injunction of attending to the culture of turnips. My crops were the first grown in this neighbourhood. This was, however, the solitary instance in which I had taken any part or concern whatever in its management. The success of my steaming, and the flattering marks of approbation conferred upon my humble endeavours, by the Board of Agriculture,



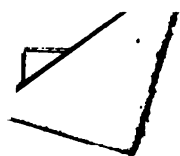


A GROUND PLAN of the SCHOONE FARM,
the Property of
J. C. CURWIEN, ESQ.
& WORKINGTON HALL,
CUMBERLAND.

This admirable precept I adopted as the rule of my agricultural proceedings ; and I have pursued it with unremitting perseverance. Taking upon me at once the whole direction and superintendence of my farm, from hence it became necessary for me to make myself acquainted with every operation.

I have been much struck since the publication of the former edition of this work, by the perusal of Mr. Blith's 'Survey of Husbandry surveyed.' In this is detailed much of the best practice of the present day, as indeed in other authors of the same period. Amongst other things is given a description of a double coulter plough, which Lord Somerville has recently improved. That agriculture has not made a more rapid progress does not appear to be from a want of knowledge, but from a want of encouragement. Till the demand for the produce of the earth exceeds the quantity produced at home, the stimulus is wanting to call husbandry into action. Agriculture is the offspring of arts and commerce. From these in due proportion springs the most happy and prosperous state of any country.

The errors I committed were no doubt numerous ; however they were not entirely without their advantage. Every failure proved a fresh incentive to energy and exertion. Practical knowledge is the most serviceable, and perhaps the only knowledge to be relied upon. Though agriculture be so ancient an art, and has of necessity been practised in every country without intermission ; yet so little attention has been paid to principles, that what has been generally written upon



GENERAL HINTS ON FARMING.

SHOULD the preceding essays have merited any share of the public attention, either on the grounds of their general usefulness, or from the correct attention with which the experiments have been made, it may not be unacceptable to the friend of agriculture, to enlarge the sphere of his enquiry, by perusing the few general remarks which have occurred to me in the progressive management of my own farm, or have resulted from my observations of the practice of others.

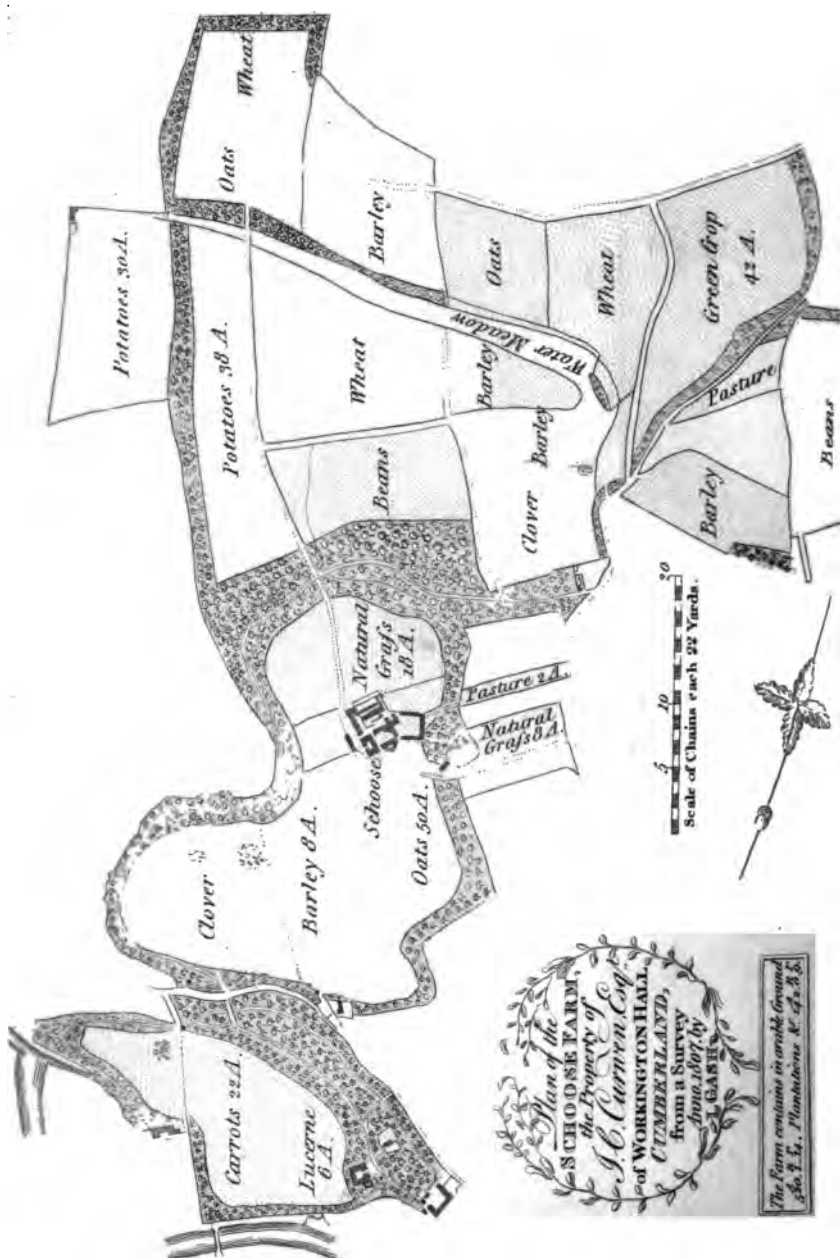
FARMING BY GENTLEMEN.

If farming, as is boldly and confidently asserted by many, be a pursuit in which gentlemen must of necessity be losers, it may not be useless to ascertain from what combination of circumstances this failure arises. Conceiving that nothing is more conducive to the interests of agriculture than the practice and encouragement of it by gentlemen, I am anxious therefore to examine into the grounds of an opinion, which appears to militate against past as well as present experience. The advantage of the public, not less than the virtuous happiness of its individual members, are deeply implicated in the decision of this question. In

proportion as example is more forcibly illustrative of imperfect practice than the most cogent reasoning, I present myself to the attention of my readers : and in detailing the causes which led me, at a late period of my life, to undertake the superintendence of my own house-farm, after having neglected it for upwards of 20 years, I am desirous of benefiting those, who from choice or other motives may, like myself, be induced to a constant residence in the country. The apprehensions generally entertained in the year 1801, from the failure of the hay crops, and the difficulties likely to arise in the providing food for any considerable number of horses, roused me from my indifference, and impelled me to dedicate my most serious attention to the subject. The result of my inquiry was the adoption of the plan for steaming potatoes, mixed with cut straw, as a substitute for hay. Hence an alternative which I had every reason to consider as likely to be productive of very serious loss, proved most unexpectedly a source of profit, and afforded me, what was not within my expectation, a fund of pleasurable amusement. For above 20 years I had confided the management of my farm, which was of some magnitude, entirely to the direction of a ~~tenant~~ ^{tenant}, with the single injunction of attending to the culture of turnips. My crops were the first grown in this neighbourhood. This was, however, the solitary instance in which I had taken any part or concern whatever in its management. The success of my steaming, and the flattering marks of approbation conferred upon my humble endeavours, by the Board of Agriculture,

culture, and the Society of the Arts and Sciences, inspired me with a decided taste for agriculture ; and I determined to remain no longer ignorant of what it is so much the interest of the proprietor to be acquainted with—the value of his estate, and the most judicious methods of cultivation and improvement.

My first inquiry was respecting the system of management, which had been practised in my own farm ; and I confess that it costs me something to be obliged to expose my own remissness and inattention ; but as an impartial statement may prove serviceable to others, I shall be more than compensated for any self-condemnation which I may have to record. It was not long before I discovered that the neglect and inattention of the owner are *maladies* of a very infectious nature, communicating their baneful effects in every direction, and enervating the exertions of all within its range. In short, I found my farm in the worst possible condition. Every thing out of order, and neither intelligence nor spirit in any one employed. The extent of the farm was upwards of five hundred acres, valued at a thousand pounds per annum. I was surprised, beyond measure, at finding that not only the whole produce of that year was swallowed up in expenses, but a debt of seven hundred pounds incurred in addition ; a very just reward for ignorance and inattention. The produce, as I have now beyond a doubt ascertained, was far short of what it ought to have been ; and the number, as well as the neglect and idleness of those employed, was out of all proportion to the work per-



The Farm contains in arable Ground
560 7 1/2 A. Potatoes & 42 3/4 A.

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

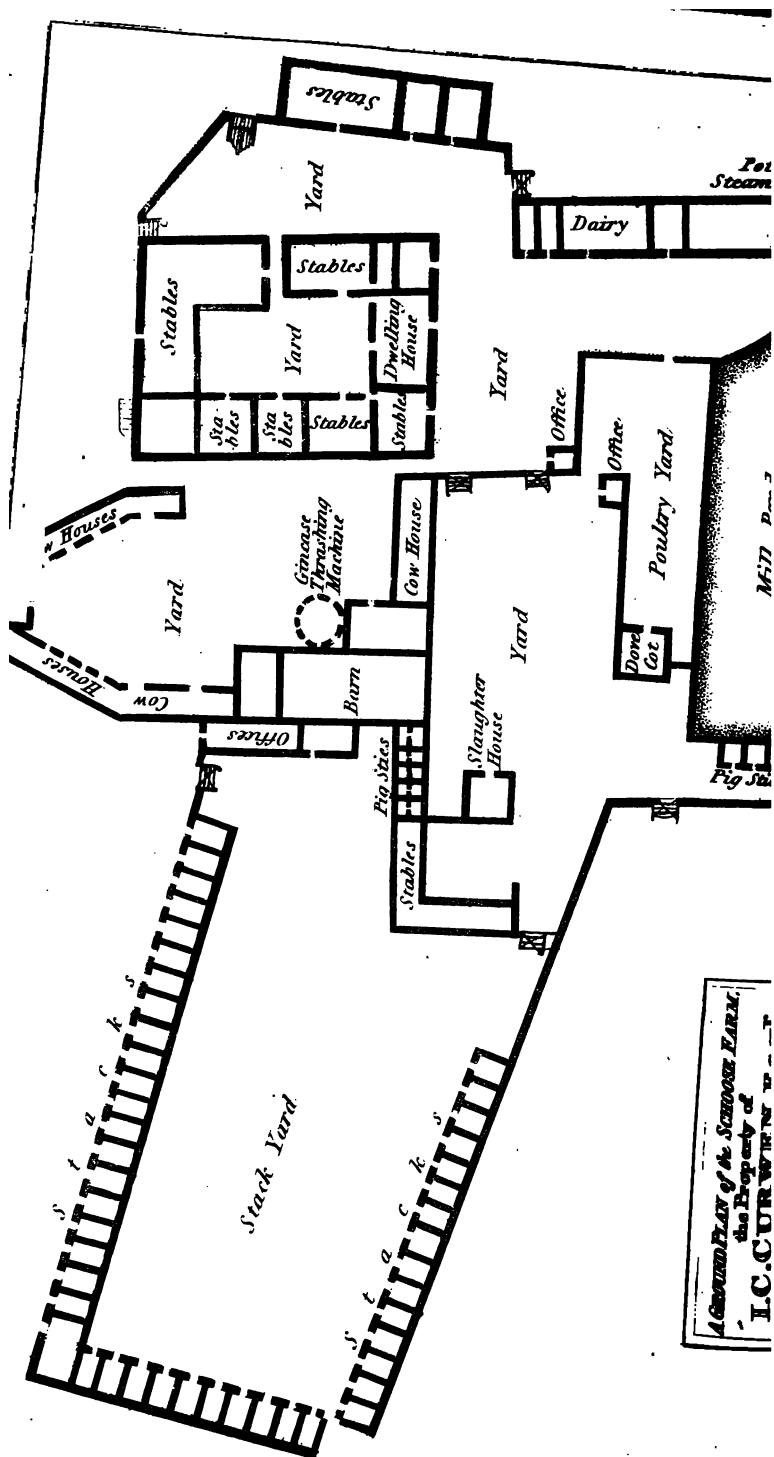
1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700

1700 7 10 1700



In going over my ground a second time, I have found it necessary to make some additional drains. I have to lament that it did not occur to me, in the first instance to lay down the drains on the plan of the farm. This would have saved much trouble to myself, and those that come after me. I strongly recommend it to those who have to begin their improvements. In the course of the last summer, I got from deep ploughing in sixty acres of the Moor-Close Farm, above 8000 single horse carts of stones. I cut 1131 roods of drains, from a yard to four feet, besides a main drain of nearly half a mile. The whole cost 3s. per rood. From the expense I was put to by removing immense coal-banks, occupying several acres, which had settled and stood some feet deep in water, breaking up and preparing, &c. for wheat, the sixty acres cost me 25l. per acre, or 1500 pounds. Public opinion has condemned it as a most injudicious expenditure. I quote it to shew the confidence I entertain of the bounty of the earth. I have no doubt the three first crops will repay me the whole expense, and leave the land worth 40s. per acre, which was not worth 10s. to begin with. Three years ago I expended 18l. per acre in draining and preparing a very miserable poor field of 28 acres for wheat. The expenditure was equally condemned. The return of the first year was as follows:—It yielded 1070 bushels of wheat.

Bushels.		£.	s.	d.
1024	sold at 4s. Od.	512	10	0
46	at 5s. 4d.	12	6	0
		<hr/>		
		524	6	0

P

Brought

	£.	s.	d.
Brought forward, - - -	524	6	0
28 acres, at 18 <i>l.</i> per acre for draining, &c. cost - - -	504	0	0
	<hr/>		
Clear above expense - - -	20	6	0

Though the Moor-close is so much nearer to the town, and better situated, I do not look for so good a crop. I offer this as an instance that may afford some encouragement to those who are fearful of expending their money on improvements.

CLEANING OF LAND.

The second operation in Agriculture is the complete eradication of weeds. Few have resolution and perseverance to do this as effectually as it ought to be done. My first attempt exhausted the patience of all employed, and (as I must candidly acknowledge) my own also. The work was only half done, and has obtained me no credit, nor afforded satisfaction to any one. Further experience has convinced me that there is no expense, which the complete cleaning of the ground will not repay. The usual method in this country has been to attempt cleaning the ground previous to sowing it with barley; but this cannot be effected without making it a late crop. There are but two methods in which it can properly be done, either by naked fallows, or in the turnip crop. My first ploughing (having a strong soil to work upon) was too shallow. For the last two winters I have ploughed all my ground intended for green crop with a chain plough of Mr. Small's, and four horses, making the furrow from
eleven

eleven to fourteen inches deep. As far as I have tried deep ploughing, it has answered admirably in the North of England, where 42. inches of rain fall in the twelve months, whilst in Norfolk they have but 22. It will be generally found impracticable to effect a complete cleaning of foul ground in one season. This gives a decided advantage to Norfolk and the Southern countries over the North, and enables them to effect their farming operations at a much cheaper rate, as also in a much shorter period. I conceive it practicable, however, by such an enlargement of the distances between the stitches, as will permit of working both with the plough and hoe throughout the season, to effect the cleaning of the ground as well, or nearly so, as from a fallow. Upon this principle, I have increased the distance between the stitches of my potatoes, and all other green crops, to double of what is commonly allowed.

To cabbages I give four feet and an half between every plant in all directions. Potatoes, which are my most important crop, I plant in beds, three feet long by two broad, giving four feet and an half length-ways, and three feet end-ways, in quincunxes, so that the plough can work in every direction. I am disposed to think that I can obtain as much weight of crop by this method, as is commonly got by any other mode, and have besides the great advantage of cleaning the ground.

By taking two green crops I can clean the foulest land perfectly well. This opinion, that on the wide stitches I can get an equally heavy crop, is formed

upon two grounds. The first is, that by having a large space to work in between the stitches, I can by constantly turning the land, during dry weather, produce an evaporation equal to what would be obtained from rain; and thereby greatly accelerates in my opinion the growth of the crop. The first day's exhalation from ploughing is in the proportion of nine hundred and fifty pounds of water per hour from an acre. The second day it decreases a third part of its evaporation, and continues to diminish for three or four days, according to the heat of the weather, when it entirely ceases, and is again renewed by fresh ploughing. I several times set glasses within a yard of each other, one on the fresh ploughed ground, the other upon what had not been ploughed for a fortnight. The evaporation of the ploughed land was as above stated, the other had none at all, the glass remaining perfectly bright and unclouded at the end of two hours. I could find no difference in the quantity of evaporation after rain, or after ploughing; they gave the same result. To have rendered the experiment perfectly complete, the state of the barometer under the glass, and in the open air should have been ascertained. I endeavoured as much as possible to exclude the air, and I conceive I was better able to do so on the ploughed land than on the hard-baked surface. That the air was not decomposed in the second glass was certain, and I should therefore be inclined to suppose it had as little effect in the other, where probably there was less of it. A field of cabbages were this year set on a very strong, stiff clay, which previous to their being planted was in
high

high tilth. The severe drought which succeeded the rains that fell soon after setting, baked the ground perfectly hard. The plants made little or no progress; they were seen by a friend of mine, on Monday the 26th of May, as I was commencing the breaking of the ground with the ploughs. They were worked for the whole week. On the Saturday they were seen again by the same gentleman, and he could scarcely be persuaded they were the same plants. The week had been very dry, with a hot sun, and strong north-east winds. The crop of last year was allowed to have been a very extraordinary one, and weighed thirty-five tons and a half per acre. Some of the cabbages were fifty-five pounds; they had only fourteen tons of manure upon the acre. My second principle is, to bury the dung as deep as possible, in order to retard the evaporation, and keep the heat in the ground, by preventing the atmosphere from acting upon it. It is a point to be particularly attended to, that the manure should be kept quite dry, which is done by having a deep trench in the center of the space between the rows. By these two combined principles, I expect I shall succeed in obtaining equal crops, though but one half, and in some instances, only a third of my ground is occupied. To pronounce decidedly that this will be the case would require further experience than I can pretend to boast of. So many circumstances ought to be taken into consideration in every experiment, that many trials must be had before it can be pronounced altogether successful. I have the testimony of a very meritorious agriculturist, who has made several experiments upon this plan in

garden husbandry, and who states the most favourable result. The gentleman I allude to is the Reverend E. Ellerton, of Colston, near Ulverstone. To such as have no option, like myself, but are obliged to set their potatoes on wet ground, the plan I have followed has in one particular been found to answer a most admirable purpose. It keeps the potatoes so perfectly dry, that in this unparalleled year of wet, where in most dry grounds the loss by decayed potatoes has been very great, I have had no loss whatever. I cannot boast of the weight of my crop, but indeed it was not to be expected, being set a month later than the usual time, and the vegetation destroyed by the frost in the very beginning of September, which is a month before what is common. I am by no means discouraged or dubious of the principle on which it was undertaken, and I hope to give it a very fair trial. The first object in drill husbandry is the clearing of the ground: I should state a second, proceeding from the same operation, the nourishment afforded to the grain in dry seasons from the evaporation which it occasions. I use the harrow-hoe twice on all my drilled crops, and the benefit produced by it is quite surprising. A man and boy with one horse can do six acres per day with ease, it cleans the same breadth with the drill, or four rows at a time.

Notwithstanding all the exertions made at the Schoose, there is not yet one field in that perfect clean condition that should satisfy a real good farmer. To have land completely in the order it ought to be, not a blade of grass or weed should be discoverable in the
the

the stubbles. I have seen but few fields in that state. I am convinced it would repay the farmer to have all his land in such perfection. This season after harvest, I had all my clovers and stubbles weeded: great as is the expense, I confidently look for its repaying in the end. I see no other method by which weeds can be got the better of, than that of never suffering them to seed. At all events the operation gave bread to a number of women and children. Thus, if it does not repay the expense, it is still money well bestowed.

SEEDS AND WEEDS.

There is not any thing that demands more care and attention than the selection of seeds for laying down permanent pastures. On a principle of economy, I should recommend, where they cannot be grown under the immediate eye and inspection of the farmer, they should be purchased from seedsmen. I would not advise the making use of any seeds that come off ground that was not known to be completely clean; and I am sorry to say I do not know much ground that can be styled such. A friend of mine, who had bestowed particular attention on a piece of land, with a view of having something creditable to shew, not having grass seeds of his own, was induced to borrow some of a neighbour. Conceive what was his astonishment, after reaping the barley, to see his field covered with docks! Inattention to weeds near homesteads is productive of most injurious consequences.

I had long been at a loss to conjecture, how it was possible for the dock to be so multiplied: this led me to an examination of the seeds they contained. In the first I examined, which was of unusual size, I found fifty-two thousand seeds, in the second three thousand. This fully explained the mystery, and if known should stimulate farmers to have such pests carefully destroyed. In climates where there is much moisture the weeds will be found more difficult to eradicate. Twitch or couch-grass is the greatest enemy I have to contend with. Though no friend to naked fallows, I was obliged to have one hundred and fifty acres under fallow this year; it joined part of a farm just taken into my own management, and had been so exhausted and so over-run with twitch-grass, that it was not in a state to bear a crop of any kind. As a proof of this, as much twitch has been got out as mixed with hot lime afforded full seven hundred carts of vegetable mould, and helped in some measure to repair the injury it had done. Notwithstanding every possible exertion it will require a fallowed green crop before it can be pronounced clear.

ACCOUNTS AND EXPERIMENTS.

Every transaction within the farm ought to be clearly defined, and the expense and gain as fairly deduced as any mathematical problem. The cost of feeding every animal should be ascertained. The weight and degree of nourishment in every species of green crop should

should be fully known. By these means accurate calculations may be made of the duration of all crops, and the losses sustained by over-stocking be avoided. I have obtained more insight into the value of crops, and the extent to which they would support my stock, by weighing certain given portions of them, than by any other means. Knowing the consumption of food of each beast, I am able to judge of the expediency of an immediate sale, or of keeping it as part of my stock. I should also recommend experiments to determine both the weight and the produce of every crop of grain. These things, plain and simple as they appear, are not generally attended to. By some they may be considered as too minute; yet who that has made any extensive observations on the conduct of a farm, but must have frequently witnessed the greatest distress from a want of fodder. Had the precautions which I suggested been followed, either the consumption of food would have been diminished, or a part of the stock sold in time to prevent the loss and inconveniences arising from their subsistence.

LABOUR AND WORKMEN.

To know how work should be executed, and to be able to judge what is a fair day's work, are objects of great moment to the farmer. In these particulars the greatest imposition may be practised.—Habit and attention are the only means of acquiring this knowledge; and it is in this that gentlemen find themselves inferior

inferior to those who have been regularly brought up to the business. Besides the attention necessary to obtain a full and perfect judgment on these points, I should advise the adoption of means to inspire the workmen with an interest and pride in the well-executing of every operation in the farm. A few real good men are invaluable, their example will in time have its effect on the others who are employed. To attempt by an advance of wages above the established rate to draw good men from other services, is neither just nor liberal, and is injurious to the general interest of agriculture, which ought to influence all who engage in the same pursuit. I can, however, see no reasonable grounds to object to bestowing of rewards on such as may distinguish themselves by superior exertions, especially at seasons when exertion is more particularly called for. To witness our fellow creatures engaged in carrying on any occupation in which we are interested, and performing their service with cheerfulness and alacrity, is a rich source of gratification to an enlarged and liberal mind, well worthy of being purchased with kindness, attention, and encouragement.

It is I think very practicable, and within the power of almost every farmer, to excite a spirit of enthusiasm in those whom he employs, and to turn it to the best of purposes. I do not pretend to say this is the work of a week, or of a few months, but that a system may be established for bringing it about. The plan I should propose, would be the taking apprentices, which might be easily and advantageously done in every large farming

ing establishment. A degree of education suitable to their future employment, as well as to their quickness of comprehension, should in my opinion be bestowed upon them; and their rise in situation and confidence should be gradual, and altogether proportioned to their exertions. In boys it is no difficult matter to create a spirit of emulation and rivalry; and this directed to proper objects, would scarce fail of rendering them valuable servants during the time of their binding, and afterwards decent and useful members of society. I do not offer this as a speculative opinion, but one that has been practised for years in the different branches of work connected with my collieries, and which has produced most admirable workmen; and to complete skill as artificers is united an attachment to their employer, and to the place where they have spent their early youth. I have every reason to believe this plan of apprenticeship to farming will answer equally well, and I have taken ten apprentices already into my own farm. The number under my different workmen are, perhaps, forty. If they conduct themselves to my satisfaction, on the expiration of their indentures they receive a present of ten guineas; but this entirely depends on their own good conduct; and but one single instance has occurred in which it has been withheld. I have them instructed in reading and writing, which not only enables them to acquire a more perfect knowledge of the business they are engaged in, but fits them afterwards to establish themselves. I hope that many of those whom I am now bringing up, will in time obtain farms of their own, and
be

be able to turn to their own advantage what they have seen practised from their earliest days. No plan appears better calculated than this for generally diffusing experimental knowledge, overcoming the prejudices of long habits, and introducing a more improved and correct system of agriculture.

Little progress has yet been made in the greatest part of the kingdom towards the saving of labour, and I am often astonished at seeing the ill-constructed carts, waggons, &c. of some of the best cultivated parts of the kingdom. It might be highly serviceable, if among the other rewards offered by the Agricultural Societies, premiums were given for models of waggons and carts, constructed on the simplest principles, and which should require the least draft. I was a few years ago greatly amused at seeing a waggon exhibited that could be disengaged, and made into two double carts. I will venture to say, without any regard to the first cost, that such a cumbersome vehicle would have required two if not three horses more to draw it, when fully loaded, than would have been necessary to carry the same load if divided in single horse carts.—Whatever is not useful is blameable, and such machines ought not to be sanctioned by those whose judgment may influence, and consequently mislead others.

DIFFERENT COUNTRIES.

Something is to be learnt in almost every district, but the indiscriminate introduction of every new practise

time where the circumstances of climate, and soil, &c. which peculiarly recommend it, may be totally different, is highly absurd. For instance, the drill husbandry of turnips upon stitches answers admirably in the northern districts, where there is double the quantity of rain to what falls in Norfolk; but when tried in Norfolk it was found completely to fail. I should say, reverse the practice and bury the manure as deep as possible, and then sow the turnips directly on the manure, leaving twenty-four inches between the rows, this will afford room for the plough to work, which will not only afford complete cleaning, but in the operation furnish that degree of nourishment to the turnip, which in very dry seasons would be highly serviceable, and contribute greatly to the weight of the crop.

MANURES.

This method would also permit of fresh stable-litter being made use of without the necessity of its undergoing that state of fermentation, which reduces it at least one-third in bulk; and in my opinion still more in efficacy. The pains and attention bestowed upon making of dung-hills, I neither approve, nor have ever practised. I have been constantly in the habit of making use of manure immediately from the yard. The only care bestowed upon it, is to guard it as much as possible from the air and wet, and to prevent the juices draining from it. Dung and all animal mixtures I bury as deep as possible, taking care that they shall

shall lie deep. Lime, (the little I use being solely in compost) schistus, gypsum, sand, &c. are used for top-dressings.

Farther experience has induced me to alter my mode of managing manure. I have taken great care in having horse and cow dung mixed in equal quantities, and the muck-heaps formed into pyramidal shapes, so as to admit of their being easily covered with earth, which is collected for this purpose from head lands and ditches. This method prevents the evaporation, and the gas imbibed by the earth makes it equally valuable with the dung. I am indebted to Mr. Parkinson for this hint. The making what is called manure pies is a common practice in Ireland. It serves greatly to increase the quantity, which must be always acceptable to the farmer. Mr. C. Mason, of Chilton, in Durham, follows this practice, and highly approves of it. Much time is gained by having the manure so placed that it can be got expeditiously upon the ground when wanted.

I have made considerable use of gypsum, without being able to discover the least benefit produced by it. In light soils, where there is a less proportion of iron, it may be attended with advantage. Schistus, which abounds in coal countries, when mixed with lime forms a very good marl. From Fifeshire I understand it is exported for the purpose of manure.

EARLY SOWING.

Early sowing appears to me a very great and essential object, both as to the crop and also as to the time of getting in the harvest. In the North of England a fortnight might be gained by it in the time of reaping. In the course of the last year, 1807, I had the opportunity of seeing the crops in various parts of the kingdom, and uniformly the early sown crops were the best.

In the last year I top-dressed my clovers with hot lime after the first cutting, which I found answered most admirably, and produced an abundant second and third crop; the increase would alone pay the expense. I sold the second crop for five guineas an acre to an adjoining farmer, who for his own farm paid twenty-five shillings an acre rent, and he afterwards acknowledged it was worth the money.

As a proof that the risk to oats from frost by early sowing is not great, some acres of that grain were sown in February two years ago, which were by accident left unharrowed, the frost set in so severe that they remained uncovered for three days, notwithstanding which I never had a finer crop. The best and finest barley exposed this year in the Workington market was sown in March. Pleased and surprised at this instance of spirit, I was anxious to know the practice of the farmer, and what had led to it. On enquiry he informed me "the year before he had been

been laughed at for being later with his harvest than any of his neighbours, which made him resolve to have the start of them another season," and he observed, it has answered so well, for the grain was harvested in August, that he was resolved to continue the practice.

LEASES.

As far as I can judge, there is nothing retards the improvement of agriculture so much as the narrow and illiberal policy of refusing to grant leases. The subject has been discussed by many, and at great length; but I have never been able to discover one solid argument in opposition to granting leases in all this mass of verbiage. No wise man would choose to embark his property dependent on the will of another, and in my opinion no liberal man should wish or suffer it. I can conceive no one doing it but under the temptation of a profit without risk. Thus both the interest of the landed proprietor, the farmer, and the public are injured. Under lease more rent would have been given, more profit obtained by the farmer, and a greater quantity of victual produced for the public. I know many instances where farmers dare not adopt an improved system of husbandry for fear of losing their farm. Recently, on the inspection of a farm, for a premium offered by an Agricultural Society, the persons appointed to view expressed their astonishment that the
land

land was not under better management, considering its nature and quality. What was the answer?

"I know I could make it of double the value, but I have no lease."

The difference of spirit and exertion in those who have and who have not leases is very apparent. If my mind had been undecided upon the subject, the following instances would have determined me to grant leases. If by the recital I can create the same sensations I myself experienced, in viewing what I am about to relate, the reader will feel himself amply requited for all the time bestowed upon the preceding pages. The fact does equal credit to the liberality of the landlord in the mode of letting his lands, and to the spirit and intelligence of the tenant, who has had the courage to expend his whole capital in an improvement, which will, from the judicious method pursued, very amply repay him, as well as double the value of the property at the termination of the lease. Mr. Overman, tenant to Mr. Coke of Holkham, has taken on a twenty-one years lease, a large tract of open land adjoining to the town of Burnham. In the last year, he made eight miles of quick fence, and in this and the year following, he proposes to make twelve miles more. So that when completed he will have formed twenty miles of fence, at an expense of above a thousand pounds. This well-informed and sensible farmer was satisfied, on calculating the expense of hurdles, and the endless charge of removing them, besides the losses by negligence, in the destruction of his crop,

that he would be a considerable gainer, by commencing with the enclosure of his farm; nor was he deterred from the attempt, by the narrow-minded principle, that at the end of his lease, the property might thereby be doubled in value. On the contrary, it appeared no small satisfaction to him, that in advancing his own interest, he should at the same time promote that of his worthy landlord. Nor will such an instance of good sense and liberality go unrewarded. No man will enjoy more heartfelt pleasure than Mr. Coke, in being the friend and patron of such a deserving man; and in seeing him and his large and promising family reap the fruits of such highly creditable and praiseworthy exertions. While I delight in recording this noble example of spirit and good sense in a Norfolk farmer, I shall be excused if I express some pride in the highly creditable exertions of a Lancashire yeoman. Mr. Yarker, of Ulverston, took an allotment of common, within a mile of the town, of sixty acres, for twenty-one years. It consisted of a barren rocky hill, so steep that it was difficult of ascent on horseback, and had previously yielded a miserable pittance for a few wretched sheep. Its value was under one shilling an acre. With a spirit and resolution seldom equalled, Mr. Yarker has succeeded in ploughing and levelling the whole, having blasted rocks, filled up holes, &c. &c. and also enclosed and fenced it. So that a plot of old ground, which formerly did not yield sustenance for fifteen persons for a single day, now affords the means of keeping them for twelve months.

months. Can all the theory that has been produced against leases weigh an atom in the scale against these two instances in favour of granting them.

Were I to be called upon to define what should be the object, wishes, and pride of a landlord, I could not do it better than by stating a toast given by Mr. Coke of Holkham, at his last sheep-shearing, "Good tenants, and long leases." A landed proprietor who acts upon such liberal principles, can scarce fail of having an opulent and respectable tenantry, and a well cultivated estate. What can be more gratifying to an individual—what can contribute more to establish his character and reputation? And without intending to detract from the merit of such conduct, I must state my firm belief, that it is the best policy, and most for the interest of the proprietor. Regularity in the payment of rents, exemption from losses, are no inconsiderable object in a large landed estate. There is a farther and more important consideration, a property so let will be in a progressive state of improvement, and the tenant of ability to give an advance at the end of the lease. Who can read the spirited and judicious conduct of Mr. Overman, without wishing to have such a tenant? This truly intelligent farmer has paid the last debt due to nature from us all; the regret at his loss is not confined to his family, his landlord, and other friends, but extends to all who had the pleasure of knowing him. Leases should contain as few restrictions as is consistent with due regard to the interest of both parties. As to tillage, one only appears necessary—alternate green and white

crops, leaving the rotation entirely to the option of the tenant. This makes the tenant's interest and the landlord's the same; for without pains and attention to the green crop, the grain will fail.

An alteration of the period of entering upon farms in the north of England, at least, is wanted. Lady-day has been the usual time: I have changed it to Candlemas, and made the rents due Lady-day and Midsummer. The crop by this means is sufficient security. I do not receive the rent till Midsummer and Christmas: the right, however, remains with the landlord in case of need. The premises ought to be insured against fire, and kept in repair—Hedges and gates to be left in perfect good order. I conceive it but fair and just towards a good tenant, that two years before the expiration of his lease, he should have the offer of renewal: if he does not choose to give the rent asked, he has then sufficient time to look out for another situation. Such are the opinions which, as it appears to me, should be adopted by a great landed proprietor: such the line of conduct that best accords with his interests.

The practice followed in some counties of letting by ticket, without giving any preference to the old tenant, is a miserable system, calculated to destroy the respectable connexion between landlord and tenant, making the proprietors of land mere Jew brokers. It goes also to destroy that harmony and good understanding which has so peculiarly distinguished and existed among farmers. The practice has not common honesty in the way in which it is conducted.

The

The offers are given sealed up, and the landlord chooses which he pleases, and often exacts more from the person he prefers, under the pretext that greater sums have been bid : if this method is to be followed, let the highest bidder have it, and do not by this means obtain the opinion of the county, and afterwards make a profit of it. It is much to be lamented the practice of granting leases is on the decline. Some contend that leases emancipate a tenantry, and make them independent—others, that the depreciation of money gives to the tenant an advantage over the landlord. What I deprecate and complain of is, the spirit of mercantile calculation, which has swallowed up every other honourable consideration. The pride of being respected and beloved weighs nothing against rack-rents and servility—nay, it goes so far as to reconcile men to bad and wretched husbandry. Who that has paid the least attention but can see at one glance the tenant who has a security for his exertions, and him who has none. There are some respectable and highly distinguished families who never grant a lease or dispossess a good tenant ;—are they confident, in this age of folly and extravagance, that a successor, of whom they have little power of judging, will think himself bound to follow their example. To refuse leases is a weakness unworthy such characters—What is right to be done ought not to be neglected. Why should any one be left dependent on a will over which they have no control ? The parties are not acting on an equal footing of justice. The confidence inspired by high honor and probity induces the tenant to expend his capital,

What security has any man for life? Reliance on fair character and reputation may be the cause of as much injustice and oppression, nay more, than if the landlord were devoid of those qualities. Is there any thing more disreputable to a landed proprietor than to have frequently to enter and break up his farmers? I own it would decide my opinion of the individual who was often reduced to the necessity of practising it. Mr Kent, and no man in England has more experience, has recently written a tract upon the advantage of granting leases, published by the Norfolk Agricultural Society, states the great benefit that would arise in many counties by granting leases, where farmers would willingly pay five shillings per acre more for their lands upon a reasonable length of lease; yet this he observes is refused. Supposing the case to be by any means general, what a loss must be sustained by the revenue and the public, not only in produce, but such lands do not bear their just proportion of taxation, and thereby increase the burden of those fairly let. The legislature has recognized the principle that the farmer whose lease has been for above the period of seven years, shall pay the then value. If the folly and caprice of landed proprietors wilfully depreciates the worth of their property, why should they be exempted from paying for it? I think upon every fair principle of justice they ought to be taxed for the additional rent that could be procured on a seven years' lease. I have heard of an estate being left uncultivated, that it might not pay tythes. Could such a case have been foreseen, or had such frequently occurred,

occurred, the law would have looked upon it as disclaiming and abandoning the property, and it would have reverted to the Crown. In China, where every neglect of proper cultivation hazards a public calamity, the State considers it as a crime sufficient to forfeit the property. The length of leases must be governed by circumstances: ground in good cultivation from eleven to fourteen years. Where much improvement is wanting, twenty-one years. Near to towns, where convenience is the main object, seven years. Till letting leases generally prevails, improvements in the system of agriculture will be partial. The thorough and complete cleaning of foul ground is a work of time and great expense. In very many cases years must elapse before the tenant can hope to reap the fruits of his industry. In some places there is a kind of implied contract, that in case the landlord takes the farm from the tenant, he is to pay for the improvements. This, if acted upon, would be likely to produce an endless source of litigation. How are the improvements to be estimated? I believe the most liberal would be very unwilling to allow the full extent of what a farmer might fairly expect. Example and precedent speak with an authority not easily overcome. I would refer to what has been done in Roxburghshire, Northumberland, and Durham, and ask what has advanced these counties above the rest of Great Britain, for agriculture, and the value of land? No doubt the spirit of the farmer, under the security of long leases. The great landed proprietors have neither expended their capital nor time in promoting

what has so essentially advanced their property. They have had the wisdom and liberality to grant leases. Thence have flowed all the beneficial consequences to themselves and the public, and I trust they will ever continue steadfast friends to a system from which they have derived such important advantages.

JEALOUSY OF FARMERS.

Farmers in some districts have looked with an eye of jealousy upon the proceedings of gentlemen agriculturists. Most egregiously do they miscalculate their own interest. Is it likely that he, who knows the real value of ground, should exact above its real worth? for as he loves agriculture, and attends to it himself, he will have a pride in being the friend and patron of an industrious and thriving tenantry. They who cannot judge for themselves, must place their confidence in others, whose interest it is to obtain the highest possible rents, in order to recommend themselves to their employers, and sometimes they are said to be paid according to the advance made in the rental. Can such proprietors have any pleasure or satisfaction in an intercourse with their tenants? Let those who object to gentlemen farmers consider of these reasons, and then decide for themselves, whether the lessee of a judge, and friend to agriculture, or of him who gives no attention to it, and is under the guidance and direction of land-surveyors and agents, be in the better and more favourable condition?

Much

Much as I am disposed to recommend and admire the practice of agriculture by gentlemen, I lament when I see it pursued on a scale of expense which must be attended with certain loss. I am equally, or more concerned, when I see it assume a selfish appearance. The selling or letting rams at enormous prices carries with it the semblance of monopoly, the direct reverse of what ought to be the object of gentlemen farmers. If the expense of any stock require such prices to repay the breeder, the breed cannot be adapted to general use. High prices paid by gentlemen to farmers may tend to promote and give encouragement to breeding ; but the great landed proprietor and agriculturist should never act for one moment in a way to suffer his motives to be questioned. His interest points directly to the promotion of every great and general improvement; he should facilitate, not retard, its progress. Whilst the principles which govern his conduct are believed to be dictated by a disinterested desire to forward whatever is for the public benefit, his example and influence will be extensive. Independent of the folly of submitting to give the prices, this practice has operated to retard the general diffusion of good stock, and to keep it in the hands of the opulent.

BAILIFFS.

The general ignorance of this class of men has often been to me a subject of surprise. Few possess any knowledge

knowledge beyond the mechanical part of their profession. Ask them what is the cost of keeping or rearing animals, and they are utterly unable to give any information. Those gentlemen, actuated by public spirited motives, who embark largely in farming, without much previous knowledge, and without the power of devoting their time to it, would consult not only their interest, but their comfort and pleasure, in putting their farms under the direction of well-informed, and well-educated men, who are fully acquainted with every operation, and at the same time able to exhibit correct calculations on the probable result of every branch of agriculture. Salary, however liberal, would be a trivial consideration compared with the losses and vexations which would be prevented. Above all things (I speak from experience) I would recommend, never to suffer the person who has the conduct of the farm to have any other employment. I have known several very good bailiffs spoiled by being permitted to attend markets, and to be purchasers of cattle, &c. If they once imbibe a taste for jobbing, the farm soon becomes a secondary consideration, and they are perpetually finding occasions to be absent. A large farm can never want a superintending eye for a day, nay, I had nearly said, and perhaps not improperly, an hour, without loss to the owner. I should strongly recommend a general inspection of all implements in use, cart gear, &c. once a week, and that every man should be accountable for all things given into his possession; if taken or made use of by any other person, a fine should be incurred.

I have

I have found a general Return, or Diary, according to the form prefixed, of essential use. This obliges the clerk and bailiff to constant attention ; for if there be an omission, there are immediate means of detection and correction.

THRASHING MACHINES.

The difference in construction and cost of thrashing-machines is astonishing. Generally speaking, the machine is useful in proportion as its cost is small. Those of two-horse power are the best, most simple, and least liable to go out of repair. They are erected at an expense of from fifty to eighty pounds, exclusive of buildings : where they can be wrought by water it is most desirable. A small steam-engine does the work well ; but the danger from fire is a great objection. In most places fuel is also an object. In Scotland they have applied wind-mills to work thrashing-machines, and they are found to answer. I have it in contemplation to add one to the Schoose machine, and to make it work the chaff, turnip, and carrot cutter, and also to bruise oats. The cost in general is about 200*l*. but this must depend upon the situation and other circumstances. The most perfect thrashing-machine I have ever seen is that of C. Gibbon, Esq. of Qualmore, near Lancaster, which is worked by water, and dresses the grain twice. The whole of this gentleman's farming establishment, farm-yard, &c. is the most complete, without useless expense, that I have seen.

CONSUMPTION

CONSUMPTION OF FOOD.

In great and complicated concerns, where a numerous stock is to be fed, the greatest care and circumspection are necessary to avoid the distresses of being out of food. It requires a constant and unremitting attention. Abundance produces waste, and economy is only begun to be practised when want is become inevitable. As an example, though I had this year 200 acres of wheat, and nearly 150 of other grain, the consumption of straw was such up to the middle of December, that in three months more my stock would have been entirely exhausted. Out of this want of foresight has sprung a very useful regulation. The whole of the straw is cut, by which means one half the consumption is saved, and the horses eat it better than when given whole.

PLOUGHING.

Considering the importance of this operation, and the consequent attention given to it in all places where agriculture has made any progress, it appears strange that there should be no form of plough agreed on, as the best adapted for ease of draft, and for making good work. Almost every country has its favourite plough, and bad as the construction of many of them is, they nevertheless produce excellent work. Ease of draft is a point well worthy of attention. In proportion as the friction is lessened, so will the labour be

be lightened both to men and horses. The fault of most ploughing is inclining the plough outwards, instead of keeping it perpendicular. The best ploughing is that which comes nearest to trenching, by turning the sod completely, and exposing a fresh surface. I think it is more than probable that iron ploughs may be made to answer a good purpose; their first cost does not exceed those of wood. Iron harrows are a great improvement, the teeth being fastened by a screw; in case of their being broke, they can be repaired with little trouble, and without delay, or loss of work.

More diversity of opinion is found to exist as to deep or shallow ploughing, than might be expected. I should deem shallow ploughing four inches, medium six, deep nine; but every six years I should advise making the winter fallow twelve: I have found it invariably to answer, and it is with satisfaction I see it becoming very general in the county of Cumberland.

TASTE.

I might indeed be justly accused of presumption were I to enter the lists with gentlemen who deal in this commodity, and who are so obliging as to supply taste to such as either suppose they have it not, or do not choose to be at the trouble of exerting it. I do not mean to dispute any point with them, but I hope I may be excused if I state what I have felt on approaching

family, but the surplus of it is employed for other necessities, and the care and attention paid it does not break in on the cottager's labour, or add to it in any degree to injure or oppress him.

AGRICULTURAL WORKS.

It is to be lamented that so many hasty productions on the subject of agriculture, (some even under the sanction of names entitled to respect and attention) have been laid before the public. It has brought works on this subject into general disrepute. There is no system, however erroneous, that has not some champion. Were a beginner in agriculture to ask me what books he should study, I declare I could not answer the question by recommending any, I think I should say—observe nature, attend to the best practice, and do not read till you have acquired some opinions and knowledge of your own. If I am correct, does it not warrant this inference—that it is high time we should have some uniform system settled, as applicable to different soils and climates? At present, the more we consult authorities, the more we shall be puzzled to come to any conclusion. The evil is evidently apparent, not so the remedy; it exceeds the ability of any one, two, or half a dozen individuals. It could only be effected in a manner proper for the execution of a work of such public utility, by the united abilities of some of the first, most enlightened, and distinguished agriculturists, selected from all parts of the

the empire, occupying all the various soils, and modifications of them, aided by the most scientific chemists, botanists, mechanics, and naturalists. A code of agriculture formed by such a body would prove a source of national wealth and property, and justify the expenditure of any sum that should be necessary to its completion. Those who wish well to agriculture, and are solicitous that the taste for it should not only continue, but be extended, must feel anxious to rescue it from the ridicule with which it is threatened. Farming is not exempt from its charlatans; some actuated by folly, some by design. Those who are allured into the practice by hopes of finding the philosopher's stone, will be as much disappointed as the alchemists of old. Those who pursue it rationally will find health, amusement, with a fair return of profit. Were all the prodigies of agriculture to be collected into one volume (if any could hold them) they would form a very fit companion for the works of Baron Münchhausen.

FENCES AND PLANTING.

Nothing contributes more to the ornament of a farm than good quick fences: for beauty I should wish to see them regularly planted with forest trees. There are few farms where some spots may not be applied to planting with advantage. The miserable waste of Bow-Brickhill, planted by the late Duke of Bedford, the greatest part with Scotch firs, previously

ously not worth 6d. per acre for pasture, will, in sixty years, afford a sum to equal a rent of 15s. per acre, together with compound interest. Had larch been substituted, I think it would have made a return of 20s. It is of moment that the legislature should attend to this fact; for how few acres of oak timber of a hundred years' growth and upwards will produce the like sum. The consequence is, no private gentleman can suffer his woods to stand to become timber of a scantling fit for the navy. And when it is considered that it requires fifty acres of the best oak to build a 74-gun ship (allowing 20 ton of use wood per acre) it is impossible not to feel some degree of anxiety how a future supply is to be procured. A plan has, I understand, been lately under consideration of appropriating considerable proportion of the crown lands to the purpose of raising oak timber. Such a scheme is highly judicious, and I heartily wish it may be carried speedily into execution. The extensive fir plantations made in various parts of the kingdom bid fair to afford, in a very few years, a supply of that kind of wood, equal to our consumption. The Bishop of Landaff was among the first persons who ascertained the value of the increase of wood. Some years ago an estate was sold on the banks of Windermere, on which there were several acres of larch plantations. It was universally supposed to have been sold at a price infinitely beyond its value. The Bishop of Landaff maintained a different opinion, and great as is his authority, I own, I was one who questioned it. The consequence was, that an acre of larch,

larch, of 26 years' growth, was measured and valued tree by tree, and though the situation was much less favourable than that of the plantation in question; calculating on this datum, the wood at 60 years' growth would pay the whole purchase-money, with interest. What can be so advantageous for perpetuating families as a wooded estate, forming a sinking fund to pay off the incumbrances of each succeeding generation? From the information obtained from my friend and neighbour, the Bishop of Landaff, I have been induced to plant upwards of 700 acres of mountain land, bordering on the lake of Windermere, with above three million of trees. I rejoice in the opportunity of doing justice to the individual to whom is due the merit of having inspired in that neighbourhood the taste for planting, and to whom those who survive me will have such material obligations.

VALUE OF LAND.

Independent of the value of land, arising from the quantity, there are other considerations which have a most material influence. Locality to markets is a very important consideration; for instance, a land carriage of eight miles reduces the prices of grain 2*d.* per bushel; on wheat 5*s.* per acre; 6*s.* 8*d.* on barley; the same on oats. The power of obtaining with facility lime, or other objects of manure, is a great point. Such circumstances are often overlooked, when the expenses attending cultivation, &c. are stated. The

rent paid generally forms an inferior consideration. Were I to want a farm, the first object would be good buildings, and convenience for keeping cattle, and making manure: secondly, the quality of the soil: thirdly, its lying compactly. If I found the land wet, and that it could not be drained, no temptation of rent would induce me to take it: a fourth consideration would be the distance from markets, and the power of obtaining adventitious supplies of manure. Where manure may be purchased, land is of considerably greater value than the same quality, where the farmer has no resource but in his own management. The power of procuring hands for getting in the harvest has become a very great consideration. In some places it costs more to cut, carry, and stack, an acre of grain, than the rent. I have known it in particular situations little short of 40s. The cutting grain with a scythe is most desirable, and necessity will soon compel its becoming general. Besides the saving of expense, the dispatch would be of the greatest importance. I do not know what the premium of insurance should be on 100 acres of wheat, for keeping it exposed ten days to the chances of the weather; I believe it would amount to more than any farmer has an idea of.

MARKETS.

The weekly attendance on Markets is a great loss to small farmers, whose individual labour in many instances

instances is an object, but whose personal superintendence must always be material. When stated as a period of relaxation, I am always ready to make great allowances ; but fifty-two idle days, or the sixth part of a year, is a sacrifice a prudent man would hesitate about. I should state the account after this manner :

	£.	s.	d.
Fifty-two days, at 2s. 6d.	-	6	10 0
Loss of the work of a horse	-	13	10 0
Expenses, at 2s. 6d. per day	-	6	10 0
		<hr/>	
	£	26	0 0
		<hr/>	

Habit is so powerful, that the times change, but we proceed in the same track, and it is more than probable that not one farmer in twenty is aware of the sacrifice.

LETTING BARGAINS.

It is highly desirable to let as much work as is practicable by bargain ; this brings both parties well acquainted with the proportion of labour which ought to be performed. There is nothing I lament more than time lost by idleness ; it is a waste which benefits no one, at the same time that it encourages a spirit of dishonesty in the workman. Full, fair, and adequate wages should be given, and in return a fair and reasonable portion of work ought to be performed, not such as to injure or exhaust the workmen. There are

no farmers so well served by their labourers as the Scotch, and those in Northumberland. Each great farm has a number of cottages surrounding it; the character and conduct of every individual is under the eye and perfectly known to the employer, and a bad and worthless fellow cannot long remain in his place. The kindness and attention of the master creates a corresponding return of attachment and good will, which is one of the most interesting parts of their farming. There is also an emulation among the men to do their work well, and the disgrace of slighting their labour dispenses with that constant attention on the part of the employer, which in other places is indispensable. There is no part of their management I envy so much as the state in which they have their farm servants. Having the workmen assembled round the farm has a further advantage; they are near their employment, and at hand to receive orders, in case the weather or other circumstances require an alteration in the plan of labour for the day. When labourers have to walk some miles to a farm, it is a great additional fatigue, and takes up a large portion of their time, independent of what is requisite for rest and proper relaxation. In many instances this is a great drawback from the value of a farm.

RETURNS—ECONOMY.

The best criterion for judging of merit in farming, is to ascertain the amount of the "Returns." This is

is the touchstone, by which good or bad farming may be tried. I would always carefully distinguish between what gentlemen may with great propriety do for their own pleasure, and the embellishment of their estates ; and what they do as a part of a system of agriculture.

I have never felt more provoked, than at being told concerning any operation I have been carrying on—"It was very well for me, I might do any thing ;" which is a civil way of saying, that I might play the fool, without paying the full price of my folly. Some indulgence may be granted to gentlemen, in the extent and mode of erecting their farm buildings, as this can neither deceive the farmer, nor lead him into an expensive imitation. It may, indeed, subject the owner to the same mortification I met with, of being asked, if there were any wisdom in such an extent of building? Not able to justify my propensity, I was obliged to say, I did not think there was. From the nature of the plan I am proceeding with, of having all my cattle housed throughout the year, I require more building than in the usual mode. I have the advantage of a run of water for part of the year to work my machinery ; and I believe I shall find it to be my interest to erect a fire-engine, that when the water shall fail, I may have recourse to it, rather than do the work with horses. This I consider to be a matter depending entirely upon calculation ; that plan is best which is cheapest.

Though I am by no means disposed to doubt, or call in question the honesty and integrity of any particular class of persons, still, the fewer temptations

there are to err, and the more eyes that can be fixed upon the conduct of any considerable business, the better; for this purpose, and to save the trouble of frequent inquiry, the quantity of milk given by the cows, morning and evening, is regularly chalked up in some conspicuous place, where every one may see it; and the same is done in respect to the quantity of grain thrashed. I would extend this publicity of procedure to all the operations in the farm, in order that every individual employed, should have the eyes and attention of all the rest turned upon him; which would be not less stimulating to industry, than a guard against even the temptation of dishonest practices.

The care and management of the grain is an office of much confidence, and requires great and unremitting attention. The man who has it under his charge keeps a stock-book, as does also the clerk; and every receipt and delivery of grain must be entered down, so that at any moment, the stock on hand may be ascertained. The allowance of oats for each horse is fixed, and the whole delivered out once in the week to the stable-keeper, whose duty it is to measure it out at the stated hours of feeding.

In every new experiment the most accurate accounts are kept of the expense incurred, in order clearly to ascertain how far it may be found to answer, or what are the probable causes of failure.

And such a degree of accuracy (at all times necessary) becomes more essentially so, when it is considered, that should they, who may be disposed to adopt the plan, be misled in any part of the process,

an invincible prejudice would be raised, and all prospect of amending the slovenly practice of the neighbourhood be retarded, if not entirely lost.

In taking of stock, which is annually done in December, I prefer having a fixed price for horses, cattle, and husbandry implements. This saves trouble, and gives a more regular result of the profits than the variable prices of the market. For instance, an advance of price in horses and cattle might give an appearance of profit, when in reality the crop would have yielded none. The farm-accounts are kept at my office, where all payments are made. Once a fortnight the labourers are paid, and every man attends and receives his own money. All receipts are paid over immediately to the office, and every money transaction of sale or purchase recorded. No one, undoubtedly, has the same interest as the proprietor to have a correct account of the real profit or loss of his farm; and yet from that weakness inseparable from human nature, there are few who would not be inclined to disguise from themselves the real result, when contrary to their wishes, by charging for permanent improvements, &c. &c. Feeling this to be the case, I have put the keeping of the accounts entirely out of my own reach or controul. My bailiff has, on the same principle, no knowledge of the result till after the striking of the yearly balance. In the return of the value of the crop, there might be a momentary deception; but the succeeding year would detect both the amount of the error in the estimate, as well as the inaccuracy of the valuation. Hitherto the
estimate

estimate has always fallen below the value. The salary of my bailiff is fixed at a sum certain, with twenty pounds for every thousand pounds cleared beyond the rent and expenses. The hopes of obtaining something more valuable than mere profit, the praise and commendation of others, is a stimulus which cannot fail of operating with full effect upon every honest mind, and there are few better means of ensuring faithful service. To the two head ploughmen, I give greater wages than to the rest, as I look for their being always ready to set the example of exertion at all times when it may be particularly required. At the commencement of my farming, I encouraged all my labourers who had cottages, to keep milch cows. Since the establishment of my dairy, as they can at any time have whatever quantity they may require, either of new milk at twopence, or of skimmed milk, at one penny per quart, they find it more to their interest to purchase the milk, and have consequently given up their cows.

Taking the value of attendance, the loss in the value of the animal, and the failure of milk during winter, no one can doubt but the furnishing them with milk from a large dairy, is more for their comfort and advantage. The practice of good agriculture is a constant lesson of economy, commencing with the means of obtaining crops, and extending to the appropriation of them, and branching also through the various labours requisite in every concern of agriculture. The economising of labour is an object of the greatest importance. Where is there a farm upon the best establishment,

blishment, which would not admit of considerable retrenchment and improvement in this point? The most important savings are in the labour of horses; this is to be effected by improving the construction of waggons, carts, and other implements of husbandry. The saving of a single horse's keep, harness, shoeing, and decrease in value, is a gain of fifty pounds per annum. The Reverend St. John Priest, of Norfolk, visited this country for the purpose of ascertaining the draughts of the single horse carts, (which was copied after those in use at the Carron-works,) and on a comparison with the Norfolk waggon, one horse in five would be saved. An instance of the superiority of these carts occurred a few years ago. Mr. Faulder, a native of Cumberland, and a very spirited improver, removed to a farm at Eltham, in Kent, and took his single carts with him; he contracted for the manure from a neighbouring barracks, at so much per waggon; but having only single carts an estimate was to be made, and four of them were agreed to be taken as equal to a waggon. The bargain was so much in Mr. Faulder's favour, that the ensuing year they reduced the number to three; this also gave the balance in favour of Mr. Faulder, and finally they were settled at two.

Ten minutes saved per day, in the work of any labourer, in the twelvemonths amounts to one week's work. These are truths which should be ever fresh in the memory, in order to call forth all possible attention to every mechanical and manual operation. I feel often surprised how I could for so great a length
of

of time have overlooked very great and obvious abuses in the waste of labour. For instance, it took the labour of one person to twist straw-ropes, for binding up the straw drawn for cutting; in the room of these, I substituted ropes with rings and hooks. The drawing of the straw was held to be indispensable for cutting it properly, and this took the labour of two men. From accident or neglect, the drawing was on one occasion forgotten, and the immediate demand for it leaving no time to repair the oversight, the only resource which they had was to attempt the cutting of it undrawn. In the midst of the business I arrived, and most agreeably surprised I was to find it answer perfectly well, though attended with a little more trouble to the person employed.

Having doubled the quantity of cut straw, I consider that by thus dispensing with drawing the straw, I have saved the labour of four persons for nine months in the year. I completely concur with Des Cartes, "that it is well to doubt of every thing, in order to search for the proof."

TYTHES.

It is much to be lamented that the legislature has not hitherto taken up the subject of Tythes. Mr. Pitt had actually a project for the commutation of them. The late administration were said to have had it under consideration, with a view of relieving the Irish. The subject has been noticed by those at present

present in power. Much would it be for their credit and fortunate for the country, if this measure could be carried into effect. Steps have been taken to ascertain the state of the British clergy, and I wish that the same plan which makes a better provision for them, may do away what is found so intolerable a grievance. I have no doubt that the plan would be highly acceptable to the generality of the clergy. With some few exceptions, they are infinitely more moderate in what they exact, than the lay-impropriator. Their income is, in many instances, inadequate to their situation. It will scarce be denied, that the interests of religion, as well as good policy, require the respectability of that body to be maintained. Much it is to be regretted, that no mode has hitherto been found out of effecting this more consonant with the feelings of those who are to pay it, and at the same time less injurious to the interests of the public, who are doubtless interested in having the greatest possible produce drawn from the earth. Where tythes are taken in kind, it must prove ruinous to agriculture; for though but a tenth of the produce, it is a fifth of the manure, forasmuch as it takes two acres of straw to make manure for the cropping of one.

IRRIGATION.

This is very little introduced into practice in the North of England. A claim has been set by a lord of a manor, and owner of a mill, to the sole and entire

ture right in the water of the rivers; and in a case where no possible injury could be sustained by the mill, it is concluded to be a trespass to use the water for the purpose of irrigation. This cause is now depending in the King's Bench, and the fate of this decision involves a question of much importance to the agriculture of the country. What little I have done has been attended with complete success, and bids fair to treble the value of the meadow. The first cost has been six pound per acre. From being of the annual value of 3*l*. I conceive it will become worth 10*l*. In Northumberland I met with one instance, at Wark, where it did not seem to answer. I could obtain no satisfactory solution of the cause of the failure. Any neglect in opening the channels will most unavoidably, in a very short time, defeat all the beneficial effects.

CHOICE OF STOCK.

It appears highly desirable that agriculturists should come to some settled opinion, as to the merits and qualities of stock of various breeds, both of sheep and cattle. It should be ascertained what are the properties, what the excellence, where lie the defects of the different breeds of animals. More than one gentleman with whom I have been acquainted, persons, as far as I was able to judge, divested of all prejudice, anxious only to be right, have had the misfortune to get very wrong in their choice. After bestowing

stowing much time and attention, and incurring a great expense to procure the best breed, they have had the mortification to find themselves perfectly mistaken, and all to begin again. Fresh expenses were thus incurred, and scarce a purchaser to be found for the discarded objects of former favour. To be a complete judge of stock is certainly a rare and difficult acquirement. The science extends to many points, which would totally escape the observation of the pretenders to knowledge in this branch. For instance, I have heard of an animal being turned out of a stock of high estimation, with which ordinary judges could find no fault. What want of discernment! The cow had white eye-lashes! an indisputable proof of mongrel breed! When perfection extends to such minutiae, a man's whole life is scarce sufficient to acquire a competent knowledge of all the points of perfection. Example and fashion are so powerful, that few are capable of resisting their influence when placed within the reach of their vortex; I would be understood to mean when they are sanctioned by persons standing high in public estimation. I am not therefore surprised at the extensive scale in which most novices in agriculture embark in purchasing and feeding stock. There is something highly gratifying in the sight of fine animals. By this pursuit the public often is benefited, seldom the individual. From the scale of expense on which the breeding system is generally carried on, I should conceive all the return looked for must be in fame, not in vulgar profit. Such as wish to unite both fame and profit, will do wisely to bestow
some

some pains to ascertain the actual cost at which their stock is bred and reared, from one to any given number of years. This will, nine times in ten, prevent the heavy losses which are incurred, and lead to economy in feeding, and applying such ground only to raising stock as is likely to make some return.

SERVANTS.

Though it is a fact not to be controverted, that servants are greatly changed for the worse, in all situations, compared with what they were in former times; yet I cannot accede to the general and almost universal blame thrown on them. I believe a full proportion of the fault belongs to the masters. If those in high life suppose they are at liberty to set bad examples, without their being followed by those about them, they are sadly mistaken. He who wishes for good servants must know not only how to value them, but how to merit having them. On the conduct of domestic servants a great check and restraint is imposed, by the necessity of having a character from their last place. In farming servants this is neglected. I rejoice to see efforts making in various agricultural societies, to restrain their members from taking servants without characters. The love of change is grown so prevalent, that few farm servants choose to remain above a year, or two, in the same place. The requiring a character will make it more difficult to change, and therefore make servants more cautious of their conduct.

conduct. Though this regulation has in view the benefit of both parties, there is a circumstance which the law ought to provide. There is a punishment for a false character, but for refusing to give one from prejudice, or malevolence, there is no remedy. This is an extreme hardship; and as I hope to see the requiring characters from servants become general, a law should pass to guard the servant against injury, from masters improperly refusing to give characters.

WORKINGTON AGRICULTURAL SOCIETY.

Before I conclude these observations, I think it fair to observe, that if there be any merit in the exertions I have made, much of the commendation is due to the favour of the numerous and respectable Agricultural Society, which bears the name of this place, though supported by every part of this county, as well as by many of the gentlemen and yeomanry of adjoining counties.

Their kindness in placing me at its head, and appointing their meetings to be holden at the "Schoose," subjects my agricultural operations to an annual review. The Schoose Farm may, therefore, be considered as an experimental one. Thus am I indebted to them for a stimulus to exertion, which no other combination of circumstances could have produced. Past credit is only a pledge for future exertion. The quality of the ground on which I have to operate, is, with little exception, inferior to most. Any plan,

s

therefore,

therefore, which will succeed with me, must, as far as soil is concerned, answer in all other places. The advantages of the situation for obtaining manure is great, and in this, and this only, am I fortunate, and I endeavour to turn it to the best account.

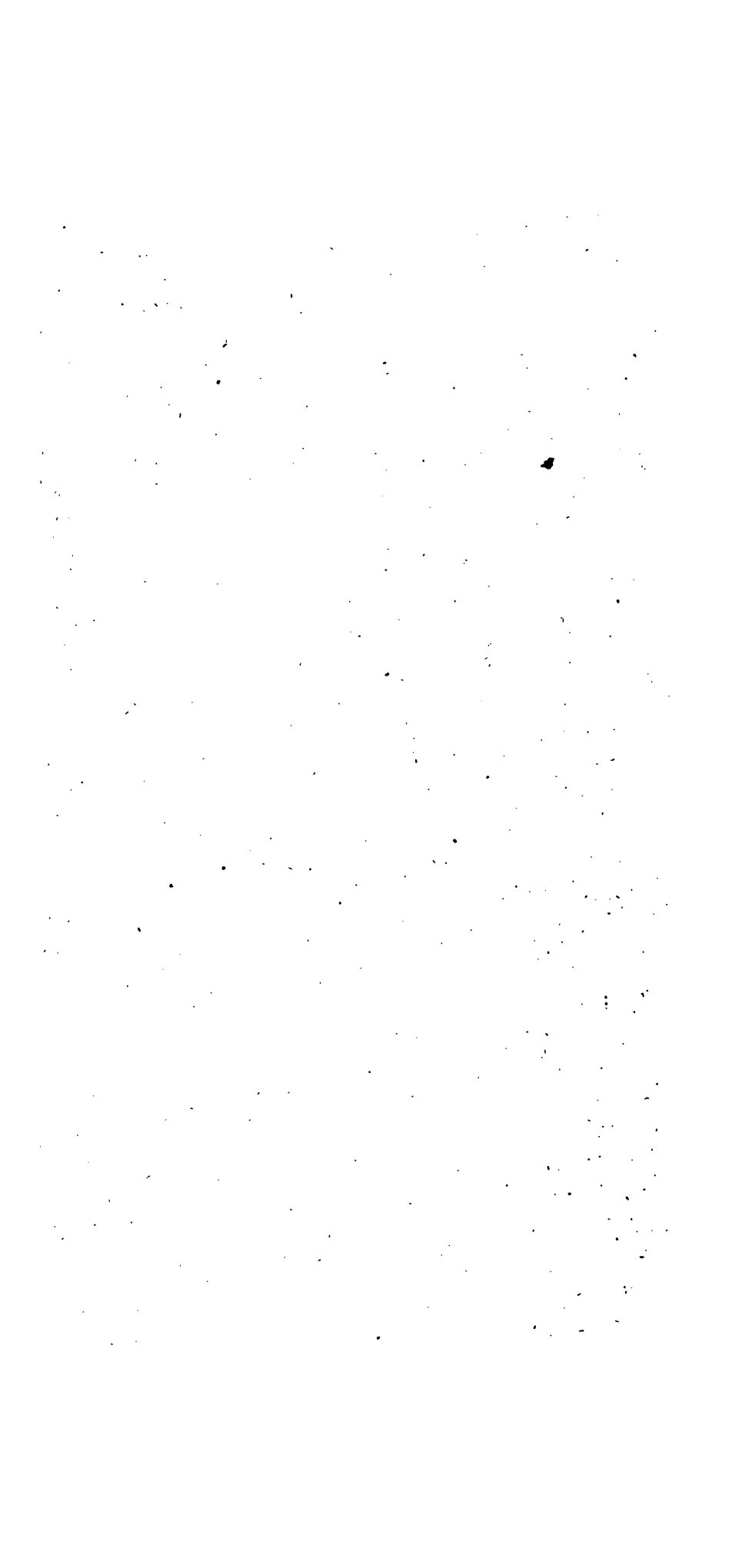
Numerous are the advantages resulting from agricultural meetings ; they create a general spirit of improvement : the commendations bestowed on merit, produce an emulation in others, and a desire to participate in the honours bestowed by such societies. They have the further advantage of impressing a strong bias in favour of agriculture in the rising generation, and these early impressions are not easily effaced. If the effect should be to decide a few young men of rank and fortune to pursue those studies, the knowledge of which tend so greatly to improve agriculture, we might then hope, without any thing chimerical in the supposition, to see the practice become universally fashionable. Not to be conversant in every subject connected with good management, and the value of property, would be supposed to be a defect of education, and considered as great a want, as it is now considered by too many, not to excel in fox-hunting, barouche-driving, or any other pursuit that has the sanction of fashion and folly.

The exhibition of well-constructed implements contributes greatly to their introduction into general practice. Some caution is necessary, not to sanction implements, the utility of which has not met the approbation of good practical farmers. The premiums offered for improvement in farming implements have multiplied

multiplied the claims for new inventions, which have no merit but their novelty, and when brought into practice are perfectly useless. The farmer who purchases one bad implement is disposed to discredit all new inventions. Before any premium is bestowed, the implement should have been tried for at least six months. The examination into every branch of management cannot fail of being highly useful.

I have stated nothing but what is the result of experience. It is not in human nature to be devoid of prejudice in favour of our own systems ; conscious of this, I have endeavoured to prevent its delusive influence, and my wish has been rather to understate than to go to the full extent of my opinions. If unintentionally I have fallen into errors, I trust to the candour of public indulgence, and I shall be at all times ready to retract an erroneous opinion, and to confirm a doubtful one by further trials.

To the territorial extent of the united empire nature has set bounds ; to the spirit and exertion of its inhabitants I know of none. By extending the improvements of agriculture to the highest point of which they are capable, the population of the kingdom may be doubled. Great Britain and Ireland, peopled by thirty millions of Britons. enjoying the blessings of a free constitution, honestly and fairly administered in all its parts, would present so firm and united a body as might bid defiance to all the efforts of the slaves of despotism.



CARROTS.

*Society for the Encouragement of Arts, Manufactures,
and Commerce, Adelphi, London, 1806.*

THE Gold Medal of the Society was this Session voted to JOHN CHRISTIAN CURWEN, Esq. M. P. of Workington-Hall, in Cumberland, for the following Agricultural Communications on his Culture of Carrots, his Method of Feeding Milch Cows in Winter, and on his Drill Horse Hoe.

*Account of Mr. Curwen's Method of cultivating
Carrots, and applying them as Food for Cattle.*

DEAR SIR,

If you judge the subjoined account of the culture of Carrots deserving the attention of the Society, I will beg you to submit it to their inspection; with many thanks for your kind attentions.

I am, dear Sir,

Your obedient Servant,

J. C. CURWEN.

Workington-Hall, Dec. 14, 1805.

TO DR. C. TAYLOR,
Secretary to the Society of Arts, &c.
Adelphi, London.

Sir,

SIR,

In Mr. A. Young's valuable and interesting Report on the Agriculture of Suffolk, I was much struck with his account of the culture of carrots, and the advantage resulting from the application of them as food for horses. From the very general opinion which prevails, that none but particular soils are applicable to the growth of carrots, the culture of them to any extent has been confined to small districts. I presume, therefore, that it may not be unacceptable to the Society to be informed of the success of trials in the cultivation of this valuable root, on a stiff loam, partaking, in a great measure, of clay. Mr. Young's observations are confined to sowing by broad-cast, which can be successful exclusively in sandy soils. The method I have pursued has been to trench, plough, and stitch up the ground intended for carrots, as soon as it was cleared of the grain, leaving it in that state during winter: its working in the spring is by this means facilitated. In April I break it up, by giving it three or four ploughings, harrowings, and rakings, which bring it into garden tilth, previous to the last ploughing, I give from ten to fifteen cart-loads of ashes per acre. The second week in April, or sooner if the season permits, it is stitched up, and made ready for sowing; allowing three feet between each stitch; and I throw the ridges as high as they can be got. The tops of the stitches are smoothed with a very light roller, so as to admit of a furrow being drawn with a hand-hoe.

The

The seed, ten days or a fortnight before it is used, is mixed with wet sand, and placed in some warm situation, so as to be in a full state of vegetation before it is sown. A fortnight is gained by this method; and the carrots are less liable to be injured by the weeds. Two pounds of seed are sufficient with care for an acre. The plough and harrow are kept at work during the whole summer. The plants are twice hand-weeded, and afterwards thinned. The expense attending this is considerable, but the value of the crop amply compensates it.

In 1804, I had an acre and a rood, which had been previously occupied by cabbages, and afterwards by tares. The tops of this crop were so abundant, that they would have fed twenty head of cattle for a month. I began cutting them too late, by which means I lost a great part. It is essentially necessary to get the carrots dry, to enable them to keep. I endeavour, if the weather be favourable, to have them up by the first or second week in October. The taking them up with gripes costs 10*l.* per acre. The crop yielded 829 Winchester bushels, equal to 4143 stone (of 14 pounds). Estimating the carrots at 6*d.* per stone, (the price of oats at that time) they were worth to me 103*l.*

Each working horse in my employ is allowed 8*lb.* of oats per day. One half was taken away, and supplied by an equal weight of carrots, and this was continued while they lasted. The general opinion was, that the horses improved in their condition upon this food.

In 1805, I had three acres and three roods of a similar soil, sown with carrots, which had previously borne a crop of oats. The first part of the season was uncommonly cold, and afterwards unusually wet, which checked the growth of the tops, so that they never got to any size, and were eaten off by sheep. In order to facilitate the work, and at the same time to save expense, I made a trial of the plough, to take off the earth from the carrots, and then setting in and turning them up.

The injury was trifling, and the expense not a tenth part what it had been. There were 108 carts of 80 stone each, or 2246 stone per acre, which at 6d. per stone would amount to 60*l.* and upwards per acre. I have made use of them as in the preceding year, with the most complete success, and saved 60 bushels of oats per week, and shall be able to continue to do so for a fortnight or three weeks longer.

In the first trial, an acre of carrots was equal in food to 23 of oats, allowing 60 Winchester bushels of oats per acre, and at three stone the bushel. On taking up the carrots, a small piece was cut from the top of each, to prevent it from vegetating, and these were immediately used. The remainder were piled in rows two feet thick, and five feet high, leaving a space between each row for a free circulation of air.

I do not doubt but that they would keep in this way for a length of time. I have always made immediate use of them, as old oats are more valuable than new, and moreover, the saving of oats is in itself a matter of much importance.

The

The success of these trials has determined me to extend the cultivation of carrots, and I have prepared ten acres for the ensuing season.

Mr. Young recommends carrots as a substitute for hay: when the expense of procuring them is small, this may answer; but when the ground is to be prepared for them at a considerable expense, cheaper substitutes may be found. The carrots are a costly article of culture; the giving of them in part instead of oats, will well answer. The expense of each acre in sowing, cleaning, and housing, will not be short of 15*l*.

Whatever system can multiply the produce of one acre into that of two or more, is, I conceive, an object to a country where the consumption of the first necessary of life exceeds what is at present produced within the empire. In this point of view I flatter myself that the present paper may not be thought unworthy the attention of the Society.

WE, ISAAC KENDAL, Bailiff, and THOMAS MOORE, Groom, to J. C. CURWEN, Esq. do certify, that Mr. CURWEN's working-horses had 4*lb*. of carrots given them in the room of so much oats, from October, 1805, to January, 1806, being three months: that without the use of carrots Mr. CURWEN allowed his working-horses from 8*lb*. to 12*lb*. of oats per day, according to the size and work of the horses: that the carrots answered every purpose, and that the horses were never in better condition than at the time they
were

were in use ; and we believe that they would not have been better, nor fitter for work, with the whole allowance of oats : that the crops of carrots have been extremely good by Mr. GURWEN's mode of management. The saving of oats was 58 Winchester bushels per week by the use of carrots upon the food of 76 horses.

Workington, May 10, 1806.

From subsequent trials I have found it advisable to leave the top uncut, and to pack the carrots with the tops outward, leaving room for the air to pass between each row. The top vegetates, but does little injury ; and carrots so treated will keep very long. I have found the same method to answer with turnips.

The last year's crop was highly productive : the tops produced upwards of four tons, and sixteen acres would average about 2000 stone per acre : they kept extremely well till the middle of March, and were a prodigious saving at the high prices at which oats have been at.

March 28, 1809.

IMPROVEMENT
IN THE
CULTURE OF VEGETABLES.

*Society for the Encouragement of Arts, Manufactures,
and Commerce, Adelphi, London, 1808.*

THE Gold Medal of the Society was this Session voted to JOHN CHRISTIAN CURWEN, Esq. M. P. of Workington-Hall, Cumberland, for his Improvements in the Culture of Vegetables. The following Communications were received from him.

SIR,

I am fearful you should suppose that I am become indolent, and that the favours so liberally bestowed on me by the Society, had ceased to operate as a stimulus to the further exertions of my humble endeavours to assist those objects which, by the fostering hand of the Society, have been so essentially promoted. You will excuse me for wishing to assure you that I am not idle, and to inform you that the objects which at present employ me are, I conceive, of great importance to agriculture.

The first is by experiments to ascertain the best and most productive mode of applying manure. The second is to determine whether the distances between
the

268 *Improvement in the Culture of Vegetables.*

the stitches in drill husbandry may not be greatly enlarged, without any diminution of crop.

I am strongly inclined to believe that where the ground is laid dry, that manure can scarcely be deposited too deep; by so doing the evaporation is retarded, and consequently the manure continues for a greater length of time to furnish nourishment to the crop.

The increase of the distances between the stitches, permits the power of continuing the operations of turning up the soil to a more extended period, which not only improves the tilth, but furnishes a greater degree of moisture by exhalation, than can be yielded from ground in that state of hardness it soon requires when undisturbed in summer. This evaporation is prodigious, though not perceptible to the eye: it is, however, fully demonstrated by a very ingenious experiment of the Bishop of Llandaff; and I am anxiously expected to form such conclusions from trials I am engaged in respecting its effects on vegetation, as may deserve the consideration of the Society.

My former objects of feeding cattle with potatoes, supplying milk to the poor, &c. are pursued with increased success. The use of potatoes as a food for horses and cattle increases daily.

I am, dear Sir,

Your faithful and obedient Servant,

J. C. CURWEN.

Ibbetson's Hotel,

London, April 21st, 1807.

TO CHARLES TAYLOR, M. D. Sec.

DEAR

DEAR SIR,

It is with great satisfaction that I have the honor of again submitting the result of my farming operations to the consideration of the Society of Arts. Deeply impressed with a sense of the many favors conferred upon me by them, I have found myself impelled, both by gratitude and inclination, to proceed with redoubled exertion, as the best return in my power.

The liberal patronage and encouragement bestowed on agriculture by the Society, has powerfully contributed to awaken the country to a just estimation of its importance, as the basis of individual happiness and national prosperity; and at this moment the empire owes its preservation and security to it.

I submit with great deference the result of my recent operations. I am disposed to flatter myself that they may lead to important consequences and discoveries, highly beneficial to agriculture. The experiments I have made tend to establish the double advantage of well cleaning and working the ground. First, as it frees the land from weeds; and secondly, as it conduces to the growth of the crop. It affords likewise a very strong demonstration in favour of using manure in its freshest state, by which not only the great usual expense of making dunghills will be saved, but the manure made to extend to the improvement of a third more land.

Most of the farm I occupy was in that state of foulness as to require, according to general practice and opinion, a succession of fallows to clean it. Be-

270 *Improvement in the Culture of Vegetables.*

ing unwilling to adopt a system which is attended with such loss, I determined to attempt to clean a part of it by green crops, and for such purpose to allow a much greater distance between the stitches than had ever been in practice. My first experiment on this plan was made on a crop of cabbages; they were planted in a quincunx form, allowing four feet and a half between each plant, in order to allow room for the plough to work in all directions. I adopted this plan of field husbandry, as affording the greatest facility in cleaning the crop, though I believe it never was before practised. Two thousand three hundred and fifty plants were set per acre (eight thousand is not unusual in the common method,) and each plant had, by computation, an allowance of a stone of manure, or less than fourteen tons per acre; though the common quantity is generally from thirty to forty tons per acre. The manure was deposited as deep as the plough could penetrate, drawn by four horses, and the plant set directly above it.

The plough and harrow constructed to work betwixt the rows, were constantly employed during the summer, and the ground was as completely freed from weeds as it could have been by a naked fallow. The very surprising weight of my crop, which in October was thirty-five tons and a half per acre, and many of the cabbages fifty-five pounds each, were matters of surprise to all who saw them, as well as to me, and I could assign no satisfactory reason for the fact. The quality of the land was very indifferent, being a poor cold clay,—the manure was very deficient of the usual quantity,—

quantity,—the plants when set by no means good,—in short there was nothing to justify the expectation of even a tolerable crop. I did not find any thing in the accounts from cultivators of cabbages to afford me a solution of my difficulties, or any clue to explain it. By mere accident I met with the Bishop of Landaff's experiment ascertaining the great evaporation from the earth, as related in his admirable *Treatise on Chymistry*; singular as it may appear, this very interesting experiment had remained for thirty years without any practical inferences being drawn from it applicable to agriculture. It appeared to me highly probable, that the rapid advance in growth made after the hoeing of drilled grain, was attributable to the absorption of the evaporation produced from the earth, and was the cause of the growth of my cabbages. With great impatience and anxiety, as I had the honour to inform you last year, I looked forward to the ensuing season to afford me an opportunity of continuing my experiment. I had long been a strenuous advocate for deep burying of manure, though my sentiments rested chiefly on opinion; this appeared to open a field for incontestable proofs of its advantage. My cabbages were last year planted on the same plan as the former year. Fortunately I extended the same principle to my potatoes, which I was obliged to set on wet strong ground, from want of a choice of land. My annual quantity of potatoe ground is from sixty to seventy acres. They were set in beds three feet long and two feet broad, leaving four feet and a half between each bed lengthways, and

and three feet endways. On each acre there were 1230 beds, and 6150 sets, or five to each bed, viz. one at each corner, and one in the middle. The sets of potatoes, when planted according to the usual most approved practice, in three feet stitches, and nine inches apart, amount to about twenty thousand. In the present, and indeed in all seasons when potatoes are scarce, the saving in planting is a considerable object. A great advantage also arises in being able to keep the potatoes and manure from wet. In the late uncommonly wet season I sustained little or no loss in my mode, which was not the case in many of the driest grounds. This plan unites hand hoeing with horse culture, and will be found serviceable in wet soils.

The lateness of planting, together with the premature frosts, prevented my forming a fair judgment as to the quantity per acre which might be obtained by this method. My view in fixing upon this plan was, to enable me to judge of the effects of evaporation, by being able to continue my operations for a longer period. I have no doubt but that in common seasons, notwithstanding the increased distance, the whole ground would be covered.

My experiments on cabbages this season commenced by planting them early in April. From the rain which fell subsequently, and continued till the beginning of May, succeeded by severe east winds, the earth became so hard and baked, that the plants had made very little progress.

In the first week in June the ploughs were set to work: as they started, Mr. Ponsonby, of Hail Hall, was

was present, and saw the crop; it was with difficulty that the ground was first broken, but by the end of the week it was brought into fine tilth. Notwithstanding the whole week had been dry, with a strong sun and severe east wind, yet such was the progress in growth of the cabbage, that when seen again by that gentleman on the Saturday, he could scarce be persuaded they were the same plants.

During these operations I had been making constant experiments with glasses, contrived for the purpose, to ascertain the quantity of evaporation from the land, which I found to amount, on the fresh ploughed ground, to nine hundred and fifty pounds per hour on the surface of a statute acre, whilst on the ground unbroken, though the glass stood repeatedly for two hours at a time, there was not the least cloud upon it, which proved that no moisture then arose from the earth.

The evaporation from the ploughed land was found to decrease rapidly after the first and second day, and ceased after five or six days, depending on the wind and sun. These experiments were carried on for many months. After July the evaporation decreased, which proves that though the heat of the atmosphere be equal, the air is not so dense. The evaporation, after the most abundant rains, was not advanced beyond what the earth afforded on being fresh turned up. The rapid growth of my potatoes corresponded perfectly with the previous experiments; and their growth in dry weather visibly exceeded that of other

crops where the earth was not stirred. The component parts of the matter evaporated remain yet to be ascertained; the beneficial effects arising from it to vegetation cannot be doubted or denied, but whether they proceed from one or more causes, is a question of much curiosity and importance.

May not a similar process here take place, as when water is exposed to the action of the air in irrigation? Is it too much to suppose some natural operation to take place in the earth, which may decompose the oxygen contained in air from the hydrogen, during the absence of the sun, which on the sun's re-appearance may be again given out in a state highly propitious to vegetation? Oxygen is found to contain carbon; and may not the growing plants imbibe it from the air, and may we not thereby account for its forming a constituent part of all vegetables?

The investigation of these objects presents a wide field for inquiry, and may lead to very important discoveries. From more or less oxygen contained in the earth, may not its proportions account for the fertility of one soil above another? May not the advantages supposed to be derived from loosening the soil, proceed from its being thus rendered in a fit state to imbibe the air? Fallows soon become so hard upon the surface, as neither to be capable of absorption or evaporation. One very important result is placed before the eyes, and within the reach of every practical agriculturist to ascertain, namely, that the evaporation from dung is five times as much as from earth,

earth, and is equal on the surface of an acre to 5000 pounds per hour. By making use of dung in its freshest state, the farmer may extend his cropping to one-third more land with the same quantity of manure. It is with regret that I have viewed in many parts of the kingdom the quantity of manure which is exposed on the surface, and tends to no good. I am strongly of opinion, that in all light soils, if the manure was buried in trenches as I propose, and the turnips sowed above it, that more abundant crops would be procured. By cleaning with the plough, great advantage would be derived to the crop, from the evaporation yielded by the earth. Hot manure might also be used. By fermentation dung is reduced to one half its bulk, and its quality reduced in a much greater proportion. The manure now commonly taken for one acre of broad cast, would, if deposited whilst hot in drills, answer for four acres, and the crop produced be much more.

If the Society of Arts extend their sanction and patronage to my exertions, I shall feel bound to proceed, and to endeavour to bring the experiments to a regular system. The glasses I used for determining the quantity of evaporation were of a bell form, and placed with the open part upon the earth; a quantity of tow was first weighed, ready to wipe off the moisture collected from evaporation within the glass, which tow was then again weighed as exactly as I could after the glass had stood for a given time, and been wiped dry with the tow; and from knowing the contents of the glass I made my calculations. Mr. Robert Wood,

276 *Improvement in the Culture of Vegetables.*

watch-maker, of Workington, attended to the experiments made with the glasses.

I have the honour to be, with great respect,

Dear Sir,

Your obedient humble Servant,

J. C. CURWEN,

Workington-Hall, Jan. 9, 1808.

To C. TAYLOR, M.D. Sec.

DEAR SIR,

It is with great pleasure and satisfaction that I learnt yesterday from Mr. Arthur Young, the Secretary of the Board of Agriculture, that he has adopted my ideas of the great importance of evaporation, and that he has actually ordered Mr. Blunt, optician, of Cornhill, to construct him an instrument for ascertaining the evaporation, which instrument I shall request Mr. Blunt to show to the Society. Mr. Young intends in the course of the summer to make a variety of experiments on the quantity of evaporation produced from different soils, agreeing with me, that the greater or less degree of it, influences most materially the luxuriance or growth of the crop.

In all the valuable tracts which Mr. Young has given to the world, he has never adverted to this, and the first knowledge of it as a principle for promoting the growth of crops was obtained from my account of the Schoose Farm, in the report of the Workington Agricultural Society, of which he is a member.

Being

Improvement in the Culture of Vegetables. 227

Being unable to account for the surprising weight of my first crop of cabbages, with only one-third of the manure usually given, I was led to make the experiments I have laid before the Society; and I believe I am not only the first person in Lancashire, but even in Great Britain, who ever thought of ploughing the ground upon the principle I have executed, for promoting the growth of the crops. I flatter myself that my experiments on the economical application of manure, will lead in a high degree to facilitate a more extended cultivation, and obviate the objections which have been started by some persons against the inclosure of waste lands, from their supposition that manure could not be furnished for more than the land at present cultivated.

I remain, dear Sir,

Your obedient Servant,

J. C. CURWEN.

Ibbetson's Hotel, Vere-street,

April 8th, 1808.

To C. TAYLOR, M.D. Sec.

CERTIFICATES.

A Certificate from Miles Ponsonby, Esq. of Hail Hall, testified that he had seen Mr. Curwen's statement of the rapid progress made by his cabbages in the month of June, 1807; that he perfectly recollects viewing them on the Monday, and again on Saturday in the same week; that the improvement in the appearance

278 *Improvement in the Culture of Vegetables.*

pearance of the plants was so great, that he imagined the land had been replanted, till Mr. Curwen explained the cause which had produced so great a change.

That he considers Mr. Curwen's plan of managing his potatoes and cabbages as very good garden husbandry, and the best calculated for keeping the land clean, improving the plant, and at the same time enriching the ground, of any that he had observed; and though the mode is entirely new there, he has no doubt but it will be found beneficial, and that it will in a few years be much attended to.

A Certificate from Mr. D. Campbell, Secretary to the Kendal Agricultural Society, stated, that he had attended to the cultivation of potatoes in most parts of Lancashire, and could speak with the greatest precision respecting it in that part of the county, which is north of Lancaster.

That whether they were planted in the lazybed way, by the dibble, or with the plough, they were always set in rows from *one end of a field, or piece of ground,* to *the other end or side,* with narrower or wider intervals, as the cultivator might deem best suited to the kind of potatoes he was raising. That he never before saw or heard of their being cultivated in beds, in the manner practised and described by Mr. Curwen; and that being more particularly desirous to ascertain whether any such method was pursued in the great potatoe district which lies south-west from Lancaster, including

including Pilling, the Felde, Rufford; and the neighbourhood of Preston, he applied to George Clayton, Esq. of Lostock Hall, and Robert Hesketh, Esq. of Warrington Hall, gentlemen upon whose accuracy the utmost dependence may be placed; and who informed him, that neither from their own knowledge, nor from inquiries they have made, can they learn that the method of cultivating potatoes alluded to, has been seen or heard of in a tract of country, where more are raised for the market than in any other of the same extent, perhaps, in the kingdom.

Mr. Campbell further stated, that Mr. Curwen's cabbages were planted at a much greater distance than any he had ever before seen; and their size far exceeded, as a general crop, any that had fallen under his observation; that the ground was perfectly clear from weeds, and from having been frequently turned over by the plough in the intervals, the mould appeared to be in fine order for a subsequent crop, and he conceived that in the two essential points of freedom from weeds, and of the land being in a fine tilth, no garden could exceed it:

Other Certificates respecting the novelty of the method of planting potatoes, as practised by Mr. Curwen, were received from the following gentlemen:

WILLIAM KNOTT, Summerhill.

Mr. SUNDERLAND, Ulverston.

J. PENNY MARSHALL, Bolton Oak.

280 *Improvement in the Culture of Vegetables.*

Further Certificates, stating the method to be new, as practised by Mr. Curwen, for planting both potatoes and cabbages, were received from the following gentlemen :

WALTER GARDNER, Crooks.

WILLIAM HARRISON, Ulverston.

A. BENSON, Reading.

HENRY RICHMOND GALE, Bardsee Hall.

JOS. PENNY, Budgefield.

EDWARD BARROW, Allithwaite Lodge.

CHARLES GIBSON, President of the Lancaster Agricultural Society.

Rev. J. BARNS, Pennybridge.

Rev. E. ELLERTON, Colton.

JOS. YORKER, Ulverston.

MICHAEL KNOTT, Thurstonville.

Rev. JOSEPH BROOKS, Ulverston.

THOMAS MACHELL, Aynsome.

Also from the following Farmers, resident in the neighbourhood of Lancaster :

THOMAS TART.

WILLIAM ARMSTEAD.

WILLIAM STALLER.

ANTHONY EIDSFORTH.

CHRISTOPHER ATKINSON.

ROBERT EDMONDSON.

DEAR SIR,

MR. CURWEN having informed me, that a question would probably arise in the Society of Arts, &c. relative

lative to the degree of exhalation of water from the earth, and it appearing to me to be intimately connected with various matters in agriculture, I think you will not be displeased at my mentioning a few circumstances, to prove that the object much deserves attention. I conceive that it bears upon the point of showing the great depth to which dung may be ploughed with safety; for when we find, as I have done, that from two to three thousand gallons of moisture are exhaled in a day from an acre of land, and that the quantity varies greatly according to the state of tillage, it should appear that such a vertical stream of vapour must remove all apprehensions of *burying* dung. I also think it goes to the point of hoeing and horse-hoeing such plants as demand much moisture. I have found that the dung in a farm-yard, laid three feet deep and hard trodden by cattle all the winter, has exhaled in the proportion of above four thousand gallons per acre in ten hours; from hence a practical conclusion may be surely drawn. I could much extend these observations, but they are sufficient to convince so enlightened a mind as your's, of the propriety of a very extensive pursuit of this inquiry.

I have the honour to be,

With much regard, dear Sir,

Your faithful and very humble Servant,

ARTHUR YOUNG.

Board of Agriculture, May 6th, 1808.

TO C. TAYLOR, M.D. Sec.



ON

FRIENDLY SOCIETIES.



ON FRIENDLY SOCIETIES*.

I HAVE great satisfaction in complying with the wishes of the Board, in transmitting them the rules of the Miners' Society of Workington, and also the amount of the poor-rates. Harrington is a separate parish. The account of another work I have not received; they are all however subject to the same regulations.

That I have not made the progress in this institution which might have been expected and hoped for, must be attributed to the prejudices I had to combat in an undertaking entirely new: and latterly, to the hardships of the times: I look forward with confidence, from the present prospect of things, to induce the people to extend their contributions, and to make comfortable provision for age and misfortunes. I must premise, that the miners are a fluctuating body, and do not look much beyond the present moment; their weekly earnings are from 18s. to 25s. A discretionary power, in extreme cases, is exercised by the committee, and though not sanctioned by rules, has always been approved. I last year proposed a benefit society for cloaths, to be divided at the end of the year, subscribing a third as my share.

* Communications to the Board of Agriculture, vol. IV.

I hope

I hope this may succeed : it is provided that the money can only be applied for cloaths. The subscription 2*d.* per week.

The town of Workington consists of nearly 8000 souls; 150 sail of vessels belong to the port; and if the expense of militia men, their families, and a hundred per annum, (payable for eighteen years for a poor-house) be deducted, the burthens of the poor will be found light. I do not know of any instance in which, my miners have cost the parish a shilling, except in cases of death; to make provision for their families exceeds the present means of my society.

To encourage the people to provide the means of support for themselves, in cases of sickness or misfortune is highly desirable, both as to the effects it produces in making them more respectable members of society, as well as exempting parishes from enormous burthens; I have always wished to promote societies, and to enable them to grant every reasonable assistance, which I do not think could be had from their own individual contributions; and to place the conduct and management of this in some measure under their own control. It is considered as dishonourable to require assistance from a fund belonging to their associates and friends, unless the necessity be real; to avoid being chargeable to a parish creates but little exertion, I fear, at present.

Were a general contribution required from every person, together with a proportionate part from the parish, and any person neglecting or refusing to pay to have no relief but in the poor-house, I am sanguine
enough

enough to believe very few would subject themselves to what is considered as disgraceful.

I offer what I have done with great diffidence, sensible it is very imperfect, but desirous of showing my respect for the Board; and looking with confidence that, through their exertions, the public may hope for much useful information, and that it may lead to some legislative regulations, beneficial for the labouring poor, and which may also tend to lessen the enormous burdens which are at present so oppressive, and which by no means contribute to render the lower orders either happy or comfortable.

The Workington Society was divided into two clubs; the Bankland, and the Moorbank Colliers. The following is their account:

Abstract of the Receipts and Disbursements for the Relief of the Poor of the Township of Workington, as under :

	Collections.			Disbursements.		
	£.	s.	d.	£.	s.	d.
From the 1st April, 1792,						
to 1st April, 1793	604	18	1	501	17	5
to October, 1793	324	1	9	358	12	0
to October, 1794	637	3	0½	501	11	6
to October, 1795	424	11	1½	475	9	1
to October, 1796	392	15	8½	513	14	0
to October, 1797	549	18	5½	509	8	9½
to October, 1798	574	3	6¾	560	5	5¾
to October, 1799	589	19	2½	691	19	2½
to October, 1800	1005	18	1	903	16	6
to October, 1801	1155	1	8½	992	19	9
	£. 6258	10	8¾	£. 6059	13	9¼
Balance in the hands of Thompson, overseer,				198	17	0
				£. 6258	10	9¼
				<i>Abstract</i>		

*Abstract Accounts of the Receipts and Disbursements,
for the Support of the Poor of the Township of
Workington.*

From the 20th of Oct. 1801, to the 9th of Nov. 1802, inclusive.

RECEIPTS.	£.	s.	d.
To balance of last year's accounts -	198	16	6
To cash for the assessments - -	828	7	2½
To cash borrowed from Wood, Thompson, and Co. for the use of the Township -	100	0	0
To cash remaining due to William Wallace, late overseer - - -	52	5	6½
To cash for paupers' work, and on account of in- fant bastard children - - -	49	8	1
To cash from Little Broughton, for house rent and paupers - - -	3	18	6
To cash on account of militiamen's families -	9	10	1
To cash from Harrington, on account of John Carr	4	6	0
To cash for John Mason's Board -	9	11	6
To ditto for Elizabeth Preston - - -	2	2	0
	<u>£. 1258</u>	<u>5</u>	<u>5</u>

DISBURSEMENTS.	£.	s.	d.
By the weekly disbursements of the house, re- movals, appeals, cloathing, &c. &c. -	457	11	1½
By cash paid on account of infant bastard chil- dren, sick paupers, &c. &c. -	297	6	11½
By abatements for vacant houses, &c. -	22	3	11
			By

On Friendly Societies.

289

By cash paid for the maintenance of two lunatics, at Newcastle, viz. William, Winn and Walker	£.	s.	d.
Brown	42	6	6
By cash paid to militiamen's families	49	19	9
By ditto paid J. C. Curwen, for interest for one year, and part principle of the sum expended in building and fitting up the house	112	0	0
By cash paid the overseers, collectors of govern- ment taxes, and keeper of the house	46	13	6
By balance due the township	230	3	8
	£. 1258	5	5

From the 10th of Nov. 1802, to the 8th of Nov. 1803, inclusive.

RECEIPTS.

	£.	s.	d.
To balance of last year's account	230	3	8
To cash for the 1st collection	£. 256	2	10½
To ditto for the 2d	510	14	11½
To ditto for the 3d	256	12	11
To ditto received for paupers' work, account of infant bastard children, &c.	69	7	4
To poundage on assessed taxes	12	7	6
To cash from Little Broughton, for house-rent and paupers	5	3	0
To cash on account of militiamen's families	7	10	0
	£. 1348	2	3

DISBURSEMENTS.

	£.	s.	d.
By the weekly disbursements of the house, as per book	461	8	0½
By			

By cash paid on account of infant bastard children, sick paupers, &c.	£.	s.	d.
	295	5	3
By cash to Tye and Sewell, market lookers	5	5	0
By cash paid Wood and Co. £. 100. and interest £. 6	106	0	0
By cash paid to William Wallace, £. 52. 5s. 6½d. and interest £. 3. 4s. 5½d.	55	10	0
By cash paid J. C. Curwen, for interest for one year, and part principle of the sum expended in building and fitting up the house £. 112, and ground-rent 5s.	112	5	0
By cash paid for the maintenance of two lunatics at Newcastle	42	13	7
By cash paid to militiamen's families	35	3	0
By defaulters in payments, per John Thompson's account	4	1	2
By abatements for vacant houses	17	19	3
By charitable abatements	4	18	3
By cash paid John Fletcher, for assisting former overseers per agreement of the old committee	15	0	0
By John Fletcher's salary, as overseer, keeper of the house, and collector of the assessed taxes	30	0	0
By balance due the Township	162	13	8½
	£. 1348	2	3

From the 9th of November, 1803, to the 5th of November, 1804, inclusive;
and continued till Easter, (20th of April,) 1805.

RECEIPTS.

	£.	s.	d.
To balance of last year's accounts	162	13	8½
To cash for the 1st collection £. 509 7 6½	1019	17	9
To cash for the 2d - 510 10 2½			
To cash for paupers' work, and on account of in- fant bastard children, up till Nov. 5, 1804	89	17	9
	To		

On Friendly Societies:

295

	£.	s.	d.
To cash for ditto, up till 20th of April, 1805	38	15	8
To poundage on assessed taxes, £. 12. 3s. 9d. and £. 12. 16s. charged in the above two sums	0	0	0
To cash from Little Broughton, for house-rent and paupers	11	7	6
To balance due to John Fletcher, overseer	193	3	7
	£. 1515	15	5½

DISBURSEMENTS.

	£.	s.	d.
By the weekly disbursements of the house, as per book, to the 5th of November, 1804	503	17	9
By ditto, ditto, to April 20th, 1805	230	0	5
By cash paid on account of infant bastard children, sick paupers; &c. to November 5, 1804	279	18	5
By do. do. do. to April 20, 1805	141	14	6
By do. paid to D. Mandal and B. Edkin, market lookers	8	8	0
By cash paid for the maintenance of three lunatics at Newcastle, to the 5th of November, 1804	57	9	7
By do. do. do. to April 20th, 1805	38	1	8
By do. paid to balloted men, per order of the De- puty Lieutenants, &c.	79	10	9
By cash paid to the drill sergeants to the W. V. per order of J. C. Curwen	43	15	9
By cash paid to militiamen's families to the 5th of November, 1804	57	10	8
By do. do. do. to April 20th, 1805	21	14	6
By abatements for vacant houses	11	4	5½
By charitable abatements	2	10	6
By John Fletcher's salary, as overseer, collector of the assessed taxes, and keeper of the house, one year and four months	40	0	0
House rent, &c. not paid	0	0	0
	£. 1515	15	5½

From the 21st of April, 1805, to the 20th of April, 1806, inclusive.

RECEIPTS.

	£.	s.	d.
To cash for the 1st collection	£. 510	11	0
To cash for the 2d	521	17	9
To do. received for paupers' work, account of infant bastard children, &c.	-	-	75 19 6
To poundage on assessed taxes	-	-	6 6 9
To cash on account of militiamen's families	-	-	52 11 0
To cash for Charles Sharp's board, 52 weeks, at 4s.	16	8	0
To balance due John Fletcher, overseer	-	-	53 5 10
	£. 1230	19	10

DISBURSEMENTS.

	£.	s.	d.
By balance of last year's account	193	3	7
By the weekly disbursements of the house, as per book	492	14	2
By cash paid on account of infant bastard children, sick paupers, &c.	383	19	1
By cash paid to D. Mandal and B. Edkin, market lookers	8	8	0
By cash paid for the maintenance of three lunatics at Newcastle	66	19	4
By cash paid to militiamen's families	49	4	7
By abatements for vacant houses	4	0	7
By charitable abatements	2	10	6
House rent, &c. not paid this year	0	0	0
By John Fletcher's salary, as overseer, keeper of the house, and collector of the assessed taxes	30	0	0
	£. 1230	19	10

From

From April 21st, 1806, to Easter, March 28th, 1807.

RECEIPTS.		£.	s.	d.
To cash for the assessment	-	522	16	1
To do. received for paupers' work, account of infant bastard children, &c. &c.	-	91	16	8
To cash on account of militiamen's families	-	16	5	6
To do. from the overseer of Harrington, on account of John Carr's expenses	-	5	16	8
To cash, poundage on assessed taxes	-	6	13	6
To do. for Charles Sharp's board, 36 weeks	-	7	4	0
February 20th, 1807. To cash, borrowed of Wood and Co.	-	340	0	0
To balance, due John Fletcher	-	18	6	9½
		£. 1008 19 ½		

DISBURSEMENTS.		£.	s.	d.
By balance of last year's account	-	53	5	10
By the weekly disbursements of the house	-	422	2	3½
By cash paid on account of sick paupers, infant bastard children, &c.	-	338	19	5
By cash paid to militiamen's families	-	59	9	0
By do. paid to Mr. Ben. Thompson, as per bill	-	21	3	0
By do. for the maintenance of three lunatics, at Newcastle, viz. W. Brown, W. Wynn, and John Carr	-	69	2	10
By cash paid the market-lookers	-	8	8	0
By abatements for vacant houses	-	5	2	2
By charitable abatements	-	1	6	8
By John Fletcher's salary, as overseer, &c. &c.	-	30	0	0
		£. 1008 19 2½		

By balance, brought down - - - £. 358 6 9½

N. B. Three instalments due J. C. Curwen, Esq. on account of the poor-house, £. 112 each.

From March 29, 1807, to Easter, April 16, 1808, inclusive.

RECEIPTS.

	£.	s.	d.
To cash for the first assessment	1058	12	2
To do. for the second do.	522	16	4
To do. received for paupers' work, account of infant bastard children, &c. &c.	52	14	6
To cash due from the overseer of Harrington, on account of John Carr's expences at Newcastle	0	0	0
To cash, poundage on assessed taxes	13	2	0
To do. received on account of militiamen's families	11	14	0
To balance due John Fletcher	258	7	8
	<u>£. 1917</u>	<u>6</u>	<u>8</u>

DISBURSEMENTS.

	£.	s.	d.
By balance, due John Fletcher	18	6	9½
By Cash, borrowed of Wood and Co.—repaid September 14th	340	0	0
Interest on do. as per statement	9	4	9
November 20th, 1805, by 11th instalment, on account of the poor house, paid J. C. Curwen, due October 30, 1804	112	0	0
Ground Rent	0	5	0
By the weekly disbursements of the house	483	8	6
By cash paid on account of sick paupers, infant bastard children, &c. &c.	432	7	3
By expences repairing the road leading to the poor-house—[See the Resolutions.]	9	11	0
October 31, paid J. C. Curwen, three instalments on account of the poor-house, till this day	336	0	0
By cash paid the market-lookers	8	8	0
By do. paid to militiamen's families	63	6	0
			By

On Friendly Societies.

291

	£.	s.	d.
By do. paid for the maintenance of three lunatics	61	18	6
By abatements for vacant houses, and an overcharge	2	9	10½
By charitable abatements	10	1	0
By John Fletcher's salary, as overseer, &c. &c.	30	0	0
	<hr/>		
	£. 19	17	6 8
	<hr/>		
By balance, due John Fletcher	£. 25	8	7 8

N. B. By act of vestry, holden December 8, 1791, it was agreed to pay 8 per cent. on the principal, or sum, expended in building the poor-house (£. 1400) for 18 years and 38 weeks.—Fourteen instalments are paid.

By comparing the different years of expenditure for the poor, there will be found a very great increase in the last few years; the high price of the necessaries of life will account for it in part. But the most striking and deplorable feature arises from the depravity of morals which is spreading most alarmingly. A few years ago the proportion of bastards to children born in wedlock was one to forty-eight; latterly, I fear, it has been one to under twenty. The burdens brought upon parishes is the least part of the evil. The total neglect of illegitimate children threatens to multiply the number of the outcasts of society. I am still now firmly of opinion of the benefits which would result to the public, were the Legislature to interfere, and take all the male bastard children, after seven years old, to educate for the army, navy, and dock-yards—considerable as the ex-

pense would be in the first instance, yet this would be lessened by the great saving which would be made in the bounties and other expenses incidental to the recruiting service. But what would the expenditure of any moderate sum be, in comparison to the effect produced on our national morals. To have this desirable object carried into execution, I should be glad, if by no other means, to see a part of the expense born by the parishes; or in exempting them from this burden, to require more care and attention being paid to the education of female bastards. To the credit of the parish of Workington, they have agreed to pay for teaching the children of all the poor, over and above what is allowed; and in many instances, where the parents can maintain themselves, but are not able to educate their offspring, the parish undertakes it; the beneficial effects of which will be speedily felt. The first symptom of decay of any nation is discoverable in its morals. Apply this to the present situation of Great Britain, and who will be bold enough to say we have not much both to regret and fear.

Bank-Lands Colliers' Society, Workington*.

	Collections.			Payments.		
	£.	s.	d.	£.	s.	d.
From August 1st, 1796,						
to 31st Dec. 1797	-	72	19 4	26	5	2
to 31st Dec. 1798	-	109	10 11	62	14	10
to 31st Dec. 1799	-	65	1 6	62	2	5
to 31st Dec. 1800	-	56	3 10	81	4	7
to 31st Dec. 1801	-	43	16 2	60	9	2
to 31st Dec. 1802	-	35	7 0	48	5	6
to 31st Dec. 1803	-	41	17 3	56	2	2
to 31st Dec. 1804	-	65	0 1	84	3	10
to 31st Dec. 1805	-	123	19 1	131	3	5
		<u>613</u>	<u>15 2</u>	<u>612</u>	<u>11 1</u>	
In the hands of Wm. Tate, treasurer			-	3	4	1
				<u>£. 615</u>	<u>15 2</u>	
	£.	s.	d.			
Collected from the Society	332	18	1			
Contributed by Mr. Curwen	232	17	1			
	<u>£. 615</u>	<u>15</u>	<u>2</u>			

* This Colliery is no longer worked.

Moorbank's

Moorbank's and Chapelbank Colliers' Society.

		Collections.			Payments.		
		£	s.	d.	£	s.	d.
Year	1792	92	3	3	87	19	8
	1793	87	18	0	186	0	4
	1794	78	13	0	79	3	8
	1795	117	19	6	122	12	8
	1796	121	13	6	111	9	2
	1797	152	1	4	141	19	8
	1798	243	15	10	243	5	9
	1799	247	5	0	235	14	9
	1800	256	5	6	286	12	9
	1801	261	9	3	331	13	10
	1802	261	4	0	320	1	10
	1803	257	2	10	477	4	1
	1804	420	11	6	515	2	7
	1805	415	5	3	615	10	8
	1806	445	19	2	517	19	10
	1807	440	8	1	507	7	8
	1808	420	17	4½	479	13	6
		4323	12	4½	4259	12	5
Deficiency made up by Mr.							
Curwen.....		956	0	4½			
		£.	s.	d.			
Contributed by the Colliers.....		3325	17	0½			
J. C. Curwen, Esq. 3-tenths proportion							
per rules		997	15	0			
Ditto further to make up deficiency ..		936	0	4½			
		£. 5259	12	5			

Harrington

Harrington Colliers' Society.

Year	Collections.			Disbursements.		
	£	s.	d.	£	s.	d.
1793 From Oct. 30, to 16 Jan. 1804	38	5	3	6	0	0
1794 to Dec. 24th -	62	14	6	45	6	7
1795 to Dec. 3d -	91	17	0	79	8	0
1797 to July 1st -	99	18	5	72	17	5
1798 to June 1st -	61	5	1	71	4	4
1799 to June 20th -	53	7	3	63	7	0
1800 to June 29th -	56	12	4	56	6	11
1801 to June 30th -	63	19	11	101	15	2
1802 to June 26th -	71	15	4	74	11	9
1803 to June 20th -	72	19	10	92	16	8
1804 to June 9th -	103	17	11	78	16	7
1805 to June 14th -	78	0	8	57	5	10
1806 to June 30th -	63	3	1	109	18	10
1807 to July 4th -	55	17	7	53	9	5
1808 -	124	12	2	62	9	2
Balance in the hands of the treasurer	-	-	-	62	3	0
	£.	1098	6 4	1098	6 4	
Collected from the members -	873	6	4			
Contributed by J. C. Curwen, Esq.	225	0	0			
	£.	1098	6 4			

RULES

FOR THE REGULATION AND GOVERNMENT

OF

THE SOCIETY OF COAL-MINERS,

Employed in the Works of J. C. CURWEN, Esq. of Workington, in the
County of Cumberland.

INTRODUCTION.

"THE COLLIERS' Society was instituted in the year 1793. The first and principal object it had in view was to make provision for unfortunate sufferers from accidents which occasionally happen in the Works, and which no skill or attention can at all times prevent. It proposed also relief against the common infirmities incident to human nature.

"The establishment of this Society was not, on its commencement, agreeable to many. The founders of it have now the satisfaction of seeing their intentions fully answered. It has proved itself burdensome to none, and a blessing and consolation to numbers.

"Under this impression, the Proprietor, warmly attached to your interest, assures you of his zealous co-operation and ardent desire to promote and contribute to any further augmentation which may afford more ample consolation to misfortune, and brighten the conclusion of lives spent in his and the public service."

The foregoing Address was prefixed to the RULES of the CLUB, in January, 1797; since which period the sanguine hopes then entertained, of extending the advantages
of

of this institution, have been fully realized by the Society cordially agreeing again to the following Rules and Regulations, on the FIRST of JANUARY, 1805.

The allowance to Widows of unfortunate Sufferers, and of those who have spent a considerable portion of their lives in these works, will (it is trusted) afford a source of considerable comfort to afflicted sufferers, and encouragement to the industrious to continue in an employ where their comfort and happiness are considered as an object of the first importance.

RULES for the COLLIERS' SOCIETY.

ARTICLE I. THE following Rules and Regulations shall be binding to all the Members, after the first day of January, 1805.

The paymaster to be the treasurer.

II. Every male member of this society, above the age of sixteen years, if his average earnings per day be two shillings and six pence, and upwards, shall pay into the hands of the treasurer sixpence per week, for the use of the society; and every such member who can earn two shillings per day, on an average, and less than two shillings and six pence, shall contribute five pence per week, for the use of the said society.

Women above fifteen years of age, shall contribute three-pence per week, for the use of the said society.—Boys, above thirteen years of age, and under sixteen, shall contribute three pence; above ten, and under thirteen, shall contribute three halfpence; and under ten years of age, shall contribute one penny: also, girls, under fifteen years of age, shall contribute three halfpence per week, for the use of the said society. And every person employed in or about the coal-works (except those who are members of another society) shall pay their contribution.

J. C.

J. C. CURWEN, Esq. the proprietor of these collieries, proposes to subscribe three-tenths of the *whole sum* subscribed by the members, for the use of the said fund.

III. A committee of twelve persons shall be annually chosen by ballot, out of such members as have been employed in the works for seven years, or upwards. The business of the committee shall be to examine into the circumstances and conditions of members claiming assistance from the fund, on account of sickness, or accident in the works. And if any doubts arise, with respect to the propriety of the claim, the surgeon's certificate (who may attend the party) shall entitle him to the following stipulated relief.

IV. Strangers, employed in the works, shall not be entitled to any relief from the fund, in case of sickness, &c. till they have contributed six successive months to the fund; unless by consent of the committee, they contribute six months subscription to the fund, on entry.

V. An officer or inspector shall be chosen annually out of the society, with a salary of two guineas per annum—whose business will be to attend particularly to cases of sickness and accident, and to give such information, from time to time, to the committee, previous to or at their weekly meeting, as he may think necessary, in order to prevent impositions.

VI. No Member of this society shall be entitled to any allowance for the first week of sickness; unless the Physician or Surgeon, who may be called in to attend the party, give it under his hand, that his disorder is of such a nature, that, he believes he will not be able to work in less than four weeks from its commencement; in such case, he may at the end of the first weeks' sickness, have the stipulated weekly allowance paid him: but if such certificate cannot be obtained, yet notwithstanding, should his sickness or disorder unfortunately continue, and incapacitate him from
work

work for four weeks, the first week's allowance will, in such case, be paid him.

VII. In cases of casual sickness, or accident, a full subscribing Member will be entitled to ten shillings per week, for the first twelve weeks: six shillings per week for the next twelve weeks; and four shillings per week afterwards, till able to work.

VIII. Members who contribute less than sixpence per week to the fund in cases of sickness, or being disabled from work, will be entitled to receive, in all cases, a weekly allowance in exact proportion, as six pence bears to the allowance to a full Subscriber; that is, Members, subscribing five pence per week, will receive eight shillings and four pence per week, for the first twelve weeks sickness; five shilling per week, for the next twelve weeks; and three shillings and four-pence per week afterwards. Members subscribing three pence per week, will receive five shillings per week, for the first twelve weeks sickness; three shillings per week, for the next twelve weeks: and two shillings per week afterwards. Members, subscribing three half-pence per week, will receive two shillings and six pence per week, for the first twelve weeks' sickness; one shilling and six pence per week, for the next twelve weeks; and one shilling per week afterwards.

IX. To every married woman, on the birth of a child, the Treasurer to advance the sum of one guinea, on demand.

X. In case of any serious accident in the works of such a nature, that the surgeon who attends the party, certify under his hand, (as in the 6th rule,) the Treasurer may advance immediately the sum of one guinea.

XI. On the death of the wife of any Member of this Society, who was not a Member herself, the husband, or surviving friends, will be entitled to the sum of twenty shillings, for defraying the funeral expenses. And on the death of a child, belonging to any Member of this Society,
above

above the age of five years, who was not a Member thereof, the parents will be entitled to ten shillings, for defraying the funeral expenses.

XII. Any Member, meeting with an accident out of his employment, occasioned by drunkenness, fighting, or any improper conduct, shall not (during his incapacity to work) be entitled to any benefit from the fund.

XIII. The widow of any Member, who shall lose his life in the works, shall be entitled, whilst she continues her widowhood, and has a child under the age of ten years, to forty shillings per annum.

XIV. The widow of any Member, who shall lose his life in the works, for every child she may have under seven years of age, shall receive one guinea, to be paid on demand.

XV. In case of the natural death of any Member, his widow will be entitled to the sum of five pounds: if no widow, the sum to be paid in equal portions to his children, after defraying thereout the funeral expenses; but if neither widow nor children remain, then three guineas to be paid, for defraying the funeral expenses. If the deceased Member shall have been twenty years in Mr. Curwen's coal-works, without interruption, and the widow can produce a certificate of her being sixty years of age, on the death of her husband, she shall be entitled to twenty shillings per annum, during life.

XVI. In case of the death of any Member, by any unfortunate accident in the works, the Members of this Society shall subscribe six pence each extraordinary, to the common fund; and the widow, or surviving children, shall be entitled to receive the sum of ten pounds, she or they defraying thereout the funeral expenses; but, if no widow or children remain, then no extra subscription to be made—the funeral expenses only to be paid, if they do not exceed the sum of three guineas.

XVII.

XVII. On the marriage of any collier, having paid his contribution to this fund for three years before, and who continues in the works for twelve months after the marriage; such Member, on these conditions, to be paid five guineas, if the state of the fund will allow it, at the time it may be due and demanded.

XVIII. Women on their marriage, according to their contribution, to have a proportionate allowance, on the same conditions.

XIX. All persons, quitting the works, to forfeit their benefit and interest in the Society.

XX. Any Member, neglecting or refusing to pay the contribution for three months, unless all arrears are paid up at that time, shall forfeit his benefit and title to the said fund; and can only be re-admitted as a stranger.

XXI. The Society shall advance out of their fund, to the DISPENSARY established in *Workington*, the sum of five guineas annually.

XXII. The Treasurer shall keep an account of all the receipts and disbursements, respecting this Society; and shall make minutes, in such an account of all the cases where relief has been given: in which account shall also be inserted, from time to time, the names of the respective committee, with the description of such cases as may come before them. These accounts to be open for the inspection of the committee, at all reasonable times, when they may require such inspection.

XXIII. The accounts of this Society to be printed and published annually.

Friendly Society, Workington.

From October 5th, 1783, to 1st Jan. 1785	Contributions.			Disbursements.		
	£	s.	d.	£	s.	d.
to 1st Jan. 1785	98	14	3	4	17	0
Interest	3	13	6			
to 1st Jan. 1786	33	0	8	18	6	0
Interest	5	0	0			
to 1st Jan. 1787	29	12	0	23	0	6
Interest	5	0	0			
to 1st Jan. 1788	31	5	0	24	3	8
Interest	6	0	0			
to 1st Jan. 1789	32	8	0	22	10	5
Interest	6	0	0			
to 1st Jan. 1790	23	10	6	19	5	6
Interest	7	10	0			
to 1st Jan. 1791	31	0	0	25	10	0
Interest	7	10	0			
to 1st Jan. 1792	26	12	0	49	18	2
Interest	7	10	0			
to 1st Jan. 1793	25	14	0	50	12	0
Interest	7	10	0			
to 1st Jan. 1794	34	0	0	37	0	0
Interest	7	0	0			
to 1st Jan. 1795	28	13	10	46	16	6
Interest	7	0	0			
to 1st Jan. 1796	27	4	0	28	6	5
Interest	7	0	0			
to 1st Jan. 1797	50	7	4	38	18	6
Interest	7	0	0			
to 1st Jan. 1798	49	13	6	46	19	0
Interest	7	0	0			
to 1st Jan. 1799	70	7	11	98	10	4
Interest	5	0	0			
to 1st Jan. 1800	70	6	0	123	2	1
Interest	8	1	3			
to 1st Jan. 1801	79	18	8	127	5	10
Interest	5	8	2			
to Dec. 19, 1801	92	0	4	101	3	0
Interest	3	6	3			
to Dec. 18, 1802	69	12	0	69	16	0
Interest	3	0	6½			
to Dec. 23, 1803	68	0	4	60	18	0
Interest	3	6	10			
to Dec. 26, 1804	63	0	4	64	8	6
Interest	3	13	1½			
to Dec. 27, 1805	53	13	6	47	18	6
Interest	8	16	10			
to Dec. 26, 1806	60	1	2	39	11	6
Interest	4	7	8			
to Dec. 25, 1807	53	11	10	41	13	8
Interest	5	12	6½			
to Dec. 24, 1808	73	0	6	82	16	0
Interest	6	12	4			
Balance in Mr. Curwen's hands	-	-	-	127	5	16
	£1420	1	9½	£1420	1	9½

**RULES AND ORDERS OF THE WORKINGTON
FRIENDLY SOCIETY, 1783.**

INTRODUCTION.

THE Friendly Society was instituted in the year 1783, with the concurrence and patronage of a large and respectable part of the town. It was the first institution of the kind in the neighbourhood, founded on the flattering representations of the benefits derived from similar societies.

However sanguine the hopes of the first founders were, the experience of fourteen years has more than confirmed them. Numbers have reason to rejoice they availed themselves of the benefits of this Society; providing thereby a source of consolation and comfort in the hour of adversity, by means comparatively small estimated upon the most moderate earnings.

The arguments on which this was first recommended to the public, have from various causes become infinitely stronger and more cogent. The advance of every article of life has greatly narrowed the sphere of benevolence, and left the happy lot of affording consolation to the afflicted in much fewer hands. If this observation be founded, must not every thinking individual feel it doubly his duty to provide by foresight and attention for the misfortune inseparable to humanity! Let those who have received the benefits of the Society reflect upon the motives that actuated the first founders, and endeavour by a grateful and animated acknowledgment of the comfort it has afforded them to recommend it to their friends and neighbours, thereby

zealously co-operating in the plan of diffusing as widely as possible the blessings afforded by the Society to those under sickness and affliction.

Articles of the Workington Friendly Society.

ARTICLE I. THAT this Society's meetings shall be held on the first Friday in every month, from the hours of seven till nine in the evening. Each new member to be hereafter admitted, to pay seven shillings and six pence entrance money : and every member to pay one shilling monthly to the stock ; four pence quarterly for the use of the Workington Dispensary, for the benefit of sick and infirm members. And that each member shall pay six pence for the funeral of any member of this society. Any member neglecting to pay as aforesaid for more than four months, to be excluded this society. And no member shall be excluded this society but for non-payment of arrears of any kind, without having his case first stated before the committee, and the same decided by their impartial judgment.

II. That John Christian Curwen, esq. is elected perpetual president of this society ; and that a committee of twelve members be elected once a year at the annual feast, who are to choose a vice-president and two stewards. The stewards to be chosen from amongst the members of the committee, and changed as often as the committee think proper ; and the vice-president to be chosen out of such members of the society as shall not be of the committee.

III. One of the secretaries shall attend the meetings to receive all monthly and other payments ; keep the accounts of

of this society; and from time to time account to the committee as they direct, the president to be accountable for all monies received by the secretaries.

IV. Every person who wishes to become a member of this society, must be proposed by a member at a monthly meeting; and if approved of by the committee, to be admitted a member the meeting following: and that no person shall be admitted as a member of this society, but such as bear a good character, and are of a sound and healthful constitution, and under the age of thirty-eight years, and produce a certificate to testify the same if required by the committee. And that this society shall not be restricted as to the number of members, but confined to the parish of Workington, and to such other persons who have been employed one twelve months previous to the time of their application to become members of this society in any work within the township of Workington.

V. To allow to a member, after paying to the fund for one whole year, seven shillings and six-pence per week, when sick, lame, blind, or infirm (so as he cannot work) and proceeding from no irregularity for twenty-six weeks: but if he continues to require assistance from the fund for a longer time; then, for the next twelve weeks, four shillings and six-pence per week; and provided he cannot at the end of that time support himself he shall receive three shillings and six pence per week, until he be able to follow some employment, or for life. And any member falling sick, &c. so as to require assistance from the fund, shall send notice thereof to the clerk of this society the third day of his sickness, and to receive his benefit or weekly pay from the eighth day of his sickness or infirmity. The stewards to visit the sick once a week, and direct the apothecary to make his report to them for the use of the committee.

V. That any member of this society who removes out of the said town or parish, if he requires assistance, is to send a certificate describing his sickness or infirmity, signed by the minister or church-wardens, or otherwise so as to satisfy the committee that he requires relief, and to appoint some person in Workington to receive the same for him during the continuance of his sickness or infirmity.

VII. That the sum of five pounds shall be paid to the widow, children, or parents; but if the member has no such kindred, the funeral expenses only to be paid by the society for the funeral of any member (after the first year) and the members of this society to attend the funeral, if convenient.

VIII. That if upon any great sickness or emergency happening, the stock or fund of this society shall be reduced to sixty pounds, then the committee to have power to lessen the weekly payments of those who are receiving benefit until the stock or fund amount to ninety pounds, and then to proceed on as before.

IX. That the members of this society do empower and authorize the president, vice-president, treasurer, and stewards, together with a majority of the committee for the time being, to lend out the society's money, and the securities for such monies to be taken in their names, and their successors for the sole use of the members of this society. And also empower them the said persons to call in the said monies so lent out; and generally to do all acts necessary for lending out, calling in, and recovering the same, pursuant to an act of parliament made for the encouragement and relief of Friendly Societies. All the necessary expenses attending the business, to be defrayed out of the society's fund.

X. That the said committee or majority of them shall have

Sisterly Society, Workington.

Years.	Collected.	Disbursed.
	£ s. d.	£ s. d.
1793 - - - - -	192 0 3	8 13 4
1794 - - - - -	84 2 4	43 19 2
Interest from J. C. Curwen, Esq.	8 10 0	
1795 - - - - -	99 6 1	59 5 1
Interest from J. C. C. Esq.	11 8 5	
1796 - - - - -	116 4 4	61 2 6
Interest from J. C. C. Esq.	13 19 11	
1797 - - - - -	109 14 8	82 19 8
Interest from J. C. C. Esq.	17 8 11	
1798 - - - - -	125 19 4	87 4 0
Interest from J. C. C. Esq.	19 16 4	
1799 - - - - -	156 5 2	61 11 0
Interest from J. C. C. Esq.	23 16 2	
1800 - - - - -	121 1 10	71 1 6
Interest from J. C. C. Esq.	27 3 0	
1801 - - - - -	114 14 2	70 2 6
Interest from J. C. C. Esq.	31 0 0	
1802 - - - - -	110 15 10	68 12 0
Interest from J. C. C. Esq.	34 15 8½	
1803 - - - - -	105 8 0	66 19 0
Interest from J. C. C. Esq.	38 12 8½	
1804 - - - - -	108 19 8	61 17 6
Interest from J. C. C. Esq.	42 9 9½	
1805 - - - - -	113 9 0	58 19 6
Interest from J. C. C. Esq.	46 19 4½	
1806 - - - - -	113 6 6	53 13 6
Interest from J. C. C. Esq.	52 5 10	
1807 - - - - -	113 13 6	91 13 6
Interest from J. C. C. Esq.	57 17 9	
1808 - - - - -	129 0 6	117 16 9
	2310 7 3½	1060 1 2
Balance in the hands of J. C. C. Esq.	- -	1350 6 1½
		2310 7 3½

RULES.

terests and purposes of this society, declared by them, and confirmed by the justices of the peace, according to the directions of the act of parliament in that case made and provided; but that all the rules, orders, or regulations, for the dissolution, or determination of this society, without said consent as aforesaid, or for the distribution or division of the stock or fund of this society contrary to the rules, orders, and regulations, which shall have been confirmed by the justices at their sessions and filed in pursuance of the act in that case made and provided shall be void and of no effect.

Sisterly Society, Workington.

Years.	Collected.	Disbursed.
	£ s. d.	£ s. d.
1793 - - - - -	192 0 3	8 13 4
1794 - - - - -	84 2 4	43 19 2
Interest from J. C. Curwen, Esq.	8 10 0	
1795 - - - - -	99 6 1	59 5 1
Interest from J. C. C. Esq.	11 8 5	
1796 - - - - -	116 4 4	61 2 6
Interest from J. C. C. Esq.	13 19 11	
1797 - - - - -	109 14 8	82 19 8
Interest from J. C. C. Esq.	17 8 11	
1798 - - - - -	125 19 4	87 4 0
Interest from J. C. C. Esq.	19 16 4	
1799 - - - - -	156 5 2	61 11 0
Interest from J. C. C. Esq.	23 16 2	
1800 - - - - -	121 1 10	71 1 6
Interest from J. C. C. Esq.	27 3 0	
1801 - - - - -	114 14 2	70 2 6
Interest from J. C. C. Esq.	31 0 0	
1802 - - - - -	110 15 10	68 12 0
Interest from J. C. C. Esq.	34 15 8½	
1803 - - - - -	105 8 0	66 12 0
Interest from J. C. C. Esq.	38 12 8½	
1804 - - - - -	108 19 8	61 17 6
Interest from J. C. C. Esq.	42 9 9½	
1805 - - - - -	113 9 0	58 19 6
Interest from J. C. C. Esq.	46 19 4½	
1806 - - - - -	113 6 6	53 13 6
Interest from J. C. C. Esq.	52 5 10	
1807 - - - - -	113 15 6	91 13 6
Interest from J. C. C. Esq.	57 17 9	
1808 - - - - -	129 0 6	117 16 9
	<hr/>	<hr/>
	2310 7 3½	1060 1 2
Balance in the hands of J. C. C. Esq.	-	1350 6 1½
		<hr/>
		2310 7 3½

RULES.

RULES AND ORDERS

TO BE OBSERVED BY

THE SISTERLY SOCIETY,

Instituted Feb. 18, 1793.

INTRODUCTION.

THE experience of some years has determined on the usefulness of Societies, instituted for the purpose of affording mutual relief and assistance in sickness and misfortune; and every reason which can be urged in the favour of such societies of men, applies with double force to a society of women. They are all of them equally exposed to the common calamities of human nature; and many of them, from the employments in which they are engaged, to all the accidents and misfortunes, arising from external causes in a life of labour. Therefore from these considerations, the utility, and even the necessity, of the following institution, must, it is apprehended, be sufficiently apparent.

By the original Rules of the Society, each member of 20 years standing was to receive 5*l.* per annum during life. Out of 160 original members on the 15th anniversary, there were 120 living. The society finding their funds would be inadequate, unanimously resolved to rescind the Rule, and to advance the weekly allowances to the sick,

TO THE SISTERLY SOCIETY.

THE liberality and good sense, which have been so powerfully exemplified in the resolution of your society, I may say, the unanimous resolution, for rescinding the twelfth rule

rule of your institution, cannot but afford the highest gratification to every feeling mind, and to all who are friendly to your society, its interests, and prosperity. As a body, the step you have taken may be viewed as a sacrifice; but as individuals liable to participate in the miseries incidental to humanity, you must be considered as having acted wisely and prudently. In your determination upon the subject, you have displayed a propriety and moderation which reflect the highest credit upon your judgment and feeling.

The immediate fruit of your decision will be, to afford a great additional comfort to the sick and afflicted. Under the regulation of the twelfth rule, which you have abolished, five guineas per annum was payable to every member of above twenty years standing; but under no circumstances could they receive any further relief:—by the regulations you have now made, in case of a protracted sickness, fourteen pounds ten shillings may be drawn the first year, and thirteen pounds a year as long as the individual may require the aid of the society. Possessed of health, the sacrifice cannot be considered as bearing any comparison with the essential comforts and blessings afforded to the afflicted.

Within the period of the establishment of your society, a great and important change has taken place in the value of all the necessaries of life: the depreciation of money has rendered the allowance for sickness of five and three shillings per week inadequate to the times. The first object of your society was to render yourselves independent of parochial relief; failing in this, your institution must have fallen to the ground: it could only have been supported in two ways, by the measure you have taken, or by a further increase of your monthly advances. As a proof that this statement is well founded, I may appeal to the smallness of admissions of new members. The deaths, from the commencement, are three in a hundred; the admissions do not exceed two, with the exception of the present year, when

when there are already above twenty, this may fairly be attributed to the hope and prospect of the change which has taken place. Thus, what appeared at first sight to be a matter of regret, has fortunately enabled you, by the sacrifice of a very uncertain benefit, to make such present advance of your weekly payments, as the circumstances of the times have rendered indispensable, with the best founded hopes of having the means of rendering the society a still greater source of solace in the hour of affliction. Past experience inculcates a lesson of caution, and it will be well to have some trial of the scale of your present expenses, before you proceed further. To encrease the advantages of the society will always be acceptable; to retrench them, however readily you might be willing, in case of necessity, to acquiesce, would be very painful and distressing to all those who are interested for you, as has been most severely exemplified upon the present occasion.

The society has gained a great object by the immediate advance of the allowances, being five years previous to the period when further benefit was to be looked for. And here it must be observed, that the members of the oldest standing, in the course of nature, are the persons most likely to reap the greatest and most immediate advantage.

The equalising the benefit to all the members of the society is an act of sound policy as well as liberality: it will be the means of alluring the rising generation to join the society, and to become the prop of your age, as others in due course of time will be of their's. It is only by keeping up the numbers of the society, that it can insure the faithful performance of its engagements. On a fair, candid, and dispassionate review, it may be fairly assumed, that the more the subject is discussed, the more reason there will be found to view what you have done as advantageous to the interest of the whole body, collectively as well as individually.

Should

Should there be found some, among so large a body, who are blessed with robust health, unacquainted with sickness, and possessed of the best grounded hopes of a long continuance of these blessings, and who look to the society for the annual annuity, rather than for an immediate solace for evils to which all are equally exposed, but which Providence has hitherto kindly exempted them from feeling; let them visit the bed of sickness, and hear the voice of thankfulness for the essential comforts the increased allowance has afforded. This, I trust, will carry conviction to their hearts; and whilst they acknowledge, with gratitude to Heaven, their own happy lot, they will also rejoice they have had the power to alleviate the sufferings of a fellow-creature.

RULES AND ORDERS.

RULE I. The Society to be under the direction and controul of a Lady Patroness, a Committee of twelve members, and two Stewardesses, assisted by a Secretary. The office of Lady Patroness to be for life; unless the appointment shall be rescinded by a vote of two-thirds of the whole body.

II. All propositions must be addressed to the Lady Patroness, or, in her absence, to the member of the committee who shall take the chair. No sister to continue speaking, after being called to order. Any member who shall be guilty of improper conduct, shall be subject to a fine of one shilling, at the discretion of the chair.

III. The society to hold its monthly meetings at Workington Hall, on the first Monday in every month, between the hours of seven and eight in the evening.

IV. No person to be admitted a member of the society,
above

above the age of forty, without the consent of the whole body, at the anniversary. In future, any person proposing to become a member, shall deliver to the secretary, at or before some monthly meeting, a certificate of her age, place of abode, and a testimonial of her character, by two or more members of the society; which certificate and testimonial shall be publicly read by the secretary: but the election shall not take place till the next succeeding monthly meeting, which shall be effected by a majority of two-thirds of the members present at such meeting,

V. All new rules and regulations to originate at the anniversary meeting. Members having rules and regulations to propose, shall give three months previous notice to the secretary, together with a fair copy of what is proposed in writing, in order that it may be put up in the society's room, that every sister may be perfectly acquainted with it; the approbation of two-thirds of the members present at the anniversary meeting, necessary to carry any new law.

VI. The appointment of secretary to be in the lady patroness; the salary to be six guineas per annum: that the offer of the lady patroness to pay one-half of the said salary be gratefully received. The committee and stewardesses to audit the accounts of the secretary every quarter, and if found correct, to subscribe the same.

The stewardesses shall take care to keep due order and regularity at all the meetings. Any member refusing to comply with their injunctions, and shall persist in improper conduct, shall be reported to the lady patroness, or in her absence, to the person who may be in the chair, by whom she shall be publicly reprimanded; and this failing of proper effect, the question shall be immediately put for the expulsion of such refractory member, to be determined by a majority of two-thirds of the members present.

VII. Any member against whom a complaint shall be made to the committee, for notorious breach of duty, or conduct

conduct disgraceful to the sex, shall be called before the committee to justify herself; if she fails in this, in the opinion of a majority of the committee, they shall at the first meeting report the same to the society, and move for her expulsion, which shall require a majority of two-thirds of the society.

VIII. The lady patroness shall be accountable to the society for all the money collected and received, and shall allow the common interest upon all balances which may remain in her hands, and shall give security for the principal and interest to the society, if required.

IX. New members must have contributed for twelve months previous to their being entitled to the benefit of the society. Members who from accidents or sickness, but not to be understood to extend to any incapacity arising from a state of pregnancy, shall be rendered incapable of following their employments, shall be entitled, having been one week previously afflicted, to receive during such incapacity, seven shillings and six pence per week for the first twelve weeks, and five shillings per week till their health shall be so restored as to permit their following their employments. In case of accidents which shall not wholly incapacitate members from doing something towards their own support, it shall be allowable for the committee and stewardesses to make them such lesser allowance, than what is given by the above rule, as they may deem just and expedient; but in all such cases, a full report of the proceeding shall be made at the first monthly meeting: and should the society disapprove what has been done, either in whole or in part, the individual who has received the relief shall pay the whole, or such part, back to the funds, at two shillings per month, as shall be ordered.

In the discharge of this discretionary power, great responsibility is imposed on the individuals of the committee; thereby, to prevent any improper relaxation of the general rule,

rule, and to call for the strictest investigation before relief is granted : on due proof being made to the satisfaction of the committee, that any member has imposed upon the society, and received the weekly allowance without being justly entitled to the same, such member shall be expelled from the society, and be precluded from all further benefit therefrom ; and her name written up in the society's room, where it shall remain for the space of twelve months ; and a statement of the fact inserted in the annual publication of the society. Weekly certificates must be produced to the secretary, attested in the form subjoined to these rules, by the medical gentleman appointed to attend this society, to authorize the payment of the weekly allowance. If the member, claiming the allowance stipulated, reside at a distance of more than six miles from Workington, she must procure a certificate of her condition from the medical attendant, if any such there be, otherwise from the minister, and transmit it to the secretary ; but in cases where the certificate of neither the one nor the other can be obtained, without considerable inconvenience, then a certificate from the churchwardens and some near neighbour, will be allowed : the member so obtaining a certificate shall appoint a person to whom her weekly allowance is to be paid for her use. The party shall have been confined one week, before she shall be entitled to relief. If the certificate be by the churchwardens and a near neighbour, the society must be satisfied at the first monthly meeting, why neither the certificate of the medical man nor minister was obtained.

X. The secretary shall prepare a list of the names, place, of residence, and complaints of such members as may from time to time, receive the benefit of this society, which list shall be hung up in the public room, for the inspection of the members, in order that frauds may be the more easily detected. The committee shall examine this list at every

every meeting, and if they see cause, shall be at liberty to order a medical person or the stewardess to attend any sick member in the neighbourhood, (at the society's expense,) and report the case of the patient.

XI. Every member of this society (unless prevented by some sufficient cause) to attend the monthly meetings, and pay the subscription; and every member who shall neglect to pay any subscription for three months, shall on the first quarterly meeting be fined six pence. If the fine and subscription be not paid in the next ensuing three months, a further fine of one shilling shall be imposed; and the member guilty of such neglect, shall be deprived of all the advantage from the institution, for half a year, reckoning from the end of the last three months. And if the monthly subscriptions and the several fines be not paid up on the next anniversary meeting, the name of such member shall be struck out of the books; nor shall she again be admitted into the society, but by a vote and payment of all arrears. No member shall be allowed to speak at this society, on a question of expulsion, without having previously communicated the matter on which she intends speaking to one of the stewardesses, and having obtained her license. All fines shall be applied to the uses of the general fund.

XII. Married sisters of this society, on being confined in child-bed, shall be entitled to receive ten shillings and sixpence. If after the expiration of one month, such sister should remain in a bad state of health, or being certified for according to the XIth Rule, she shall be entitled to the benefits thereof.

XIII. On the death of any sister of the society, who has been a member twelve months, and is not in arrears, four guineas shall be paid to her surviving friends towards the expenses for her funeral. Any sister who shall have the

misfortune of losing her husband, shall be entitled to receive four guineas from the society.

XIV. All sisters are expected to attend at the anniversary, to walk in procession to church. The lady patroness to order the dinner; and one shilling to be collected or charged to each member, towards the expenses.

XV. The accounts to be annually printed; inserting likewise the names and sums paid to each sister. Every member to be intitled to a copy of the rules, on her admission. This society to subsist so long as there are five contributing members; when reduced to four members only, these shall be at liberty to put an end to the society, and divide the stock amongst them.

XVI. No child, under twelve years of age, shall be entitled to any benefit from the society; but from twelve to sixteen years of age, she shall receive five shillings for the first twelve weeks, and three shillings after that period, so long as her illness shall continue: after sixteen to be considered as entitled to the full benefit of the allowance.

XVII. Any sister who shall have contributed for fifteen years, without having at any time been chargeable to the society, shall be entitled, on her marriage, to five guineas.

XVIII. That a medical attendant be appointed by this society, with such allowance as shall be thought reasonable; the appointment to be by a majority of the society, and not to be altered and revoked without the concurrence of two-thirds of the members, at their anniversary meeting.

XIX. That the committee and stewardesses be empowered to provide wine, in such cases and in such quantities as may be directed by a written order, under the hand of the medical attendant, appointed by this society.

XX. The form of certificates (a number of which shall be

be printed, and given by the secretary to every sister who may require the same) shall be as follows :

Medical Certificate.

I do hereby certify upon the word and honour of a medical man, that _____ is totally incapacitated from following her usual occupation, in consequence of _____

Clergyman's Certificate.

I, _____, minister of _____, do certify, upon my sacred word, that I believe _____ to be incapable of work.

Church Warden and Neighbour's Certificate.

I, _____, church-warden, do hereby certify, upon the word and faith of an honest man, that I believe _____ to be incapable of work.

I, _____, near neighbour to _____, do confirm the above certificate of the church-warden, upon the faith of my word and credit,

XXI. The society resolved that the fund should accumulate till it arrived at a sum which will yield an interest of 100l. per annum ; and then be vested in government securities, or in mortgage, as may be deemed most expedient.

Resolved, That the Rectors of Workington, Harrington, and Plumland, be Trustees for the society ; and that they be requested to see the above resolutions carried into effect.

Notice to the Society.

A note has been given to the above Trustees, by J. C. Curwen, Esq. for the amount of the balance in the Lady Patroness's hand.

It was suggested, that it might be proper to have the rules of the society registered at the quarter sessions: this was over-ruled, on the ground that there were in this sisterhood a number of highly respectable individuals, who joined the society solely with a view of promoting the benefit of their neighbours; and who would always have that weight and influence with the society, as to guard the interest of every individual, and prevent a suspicion of any members suffering from prejudice or enmity; that the interference of magistrates was, therefore, wholly unnecessary, and might be highly prejudicial to the interests of the society.

Provisional Society, Workington.

Year 1802, there were ninety-two subscribers, eight of whom failed to make good their payments.

	<i>£. s. d.</i>		
Contributions by the Society	-	55	10 0
Mrs. Curwen's donation	-	15	15 0
		<u>£. 71</u>	<u>5 0</u>
<i>Shares.</i>	<i>£. s. d.</i>	<i>Share.</i>	<i>£. s. d.</i>
As 84 :	71 5 0	1 :	0 16 5½

Year 1803.—One hundred and seventeen persons subscribed, fourteen of whom did not answer their payments.

Contributed

		£.	s.	d.
Brought forward		81	5	0
Mrs. C. 's donation		15	15	0
		<hr/>		
		£. 97	0	0
		<hr/>		
<i>Shares.</i>	£. s. d.	<i>Share.</i>	£. s. d.	
As 125	: 97 0 0	1	: 0 15 6	

Year 1807.—One hundred and thirty-four persons subscribed, six of whom did not make good their payments.

		£.	s.	d.
Contributions by the Society		83	13	0
Mrs. C. 's donation		15	15	0
		<hr/>		
		£. 99	8	0
		<hr/>		
<i>Shares.</i>	£. s. d.	<i>Share.</i>	£. s. d.	
As 128	: 99 8 0	1	: 0 15 6	

		£.	s.	d.
Year 1808.				
Contributions by the Society		70	4	0
Mrs. C. 's donation		15	15	0
		<hr/>		
		£. 85	19	0
		<hr/>		
<i>Shares.</i>	£. s. d.	<i>Share.</i>	£. s. d.	
As 108	: 85 19 0	1	: 0 15 11	

*The PROVISIONAL SOCIETY for the Year 1802,
under the direction and Patronage of Mrs. Curwen.*

THE object of this Society is to hold out encouragement, and to afford the means of providing necessary clothing, by small weekly contributions; which, it is hoped, will be found very little burdensome to any.

For

For each share the sum of three pence per week must be contributed, to be paid either by the week or month.

The whole sum to be divided at the anniversary meeting of the Sisterly Society, January 1, 1803.

Any subscriber being three months in arrear, to forfeit all claims in the society.

The division to be made in Tickets, applicable solely to the purchase of clothing, and can be applied to no other purpose.

*** Donations and subscriptions will be received by Mr. W. Swinburn.—The subscription will be open till the first of February, on each subscriber paying from the first of January.

Donations to the Society.

		£.	s.	d.
Mrs. C.	-	5	5	0
Mr. C.	-	10	10	0

To HEADS of FAMILIES.

An Easy and Advantageous Mode of providing Clothing for Children.

WHATEVER promotes industry, and stimulates exertion in the rising generation, is an object well deserving the attention of parents, both as it regards their own interest, and the future welfare of their children. With this view, the Provisional Society for furnishing clothes was instituted and weekly payments were put on so low a scale as three pence, to enable children, even under ten years of age, to earn that sum, by a very moderate exertion, in addition to their usual occupations.

Is it not an object worthy the attention of parents, to encourage their children to become contributors to this society? Is it not likely to produce emulation, and to plant the seeds of industry and exertion?

What child, if once admitted as a contributor, would not use every means in its power, rather than forego its share, and the honest pride of obtaining decent clothing?

The sum collected last year, with Mrs. C.'s donation of fifteen guineas, exceeded eighty-four pounds. The shares of each were sixteen shillings and five pence. The present year will be nearly the same.

*** The Subscription Book for the ensuing year will be open for one month at Mr. Swinburn's office; the non-payment of the contribution for two months forfeits the share.

Workington Hall, Dec. 28, 1804.

Honourable Society of Workington,
Instituted by Tradesmen and Mechanics, and patronized by
many very respectable Individuals.

<i>Received.</i>					<i>Disbursed.</i>				
		£.	s.	d.			£.	s.	d.
From 1792 to 1801 collected		1016	0	0			1016	0	0
From Jan. 1802 till Jan. 1803		101	12	3			113	2	0
do. 1803 do. 1804		75	10	8			65	9	0
do. 1804 do. 1805		81	9	2			36	14	9
do. 1805 do. 1806		92	15	10			40	1	9
do. 1806 do. 1807		81	17	8			41	6	6
do. 1807 do. 1808		90	11	2			74	7	0
do. 1808 do. 1809		89	2	11			77	7	0
		611	19	8			448	8	0

RULES

RULES AND ORDERS,

*To be observed by the Honourable Society of Workington,
which commenced Feb. 2, 1792.*

INTRODUCTION.

WHEN we look upon mankind as beings subject to an innumerable train of evils and calamities, resulting either from pain or sickness, or the infirmities of old age, which render them unable to procure even a scanty subsistence, when at the same time they are made capable of the noblest friendship, common prudence induces us so to form ourselves into society, that the insupportable condition of the individual may, by the mutual assistance and support of the whole, become tolerable. It has ever been deemed a mark of the greatest wisdom, for those who live in prosperity, and are able to endure labour, and follow their several callings and professions, to make some kind of provision against the day of adversity ; and it is evident that a man by uniting in the bonds of society, will most easily accomplish, and most effectually secure to himself, this important end.

This scheme, for alleviating our miseries and distresses, however weakly it may operate upon the minds of those who live in health and affluence, is as laudable in itself, as experience has proved it beneficial in its effects ; since it will, in all probability, not only free us from becoming burdensome to the public, but also secure us sufficient maintenance and support when in distress.

Man, like the gen'rous vine, supported lives ;
The strength he gains is from th' embrace he gives.
On their own axis, as the planets run,
Yet make at once their circle round the sun :
So two consistent motions act the soul ;
And one regards itself, and one the whole.

Thus God and Nature link'd the gen'ral frame,
And bade self-love and social be the same. POPE.

RULES

RULES AND ORDERS.

ARTICLE I. THAT the different meetings of this society shall be holden as long as it shall exist, at a private room taken for that purpose, at the expense of the society ; and any member endeavouring to remove the said meetings to any other, without the consent of a majority of this society, shall on conviction by a proper proof made to this society, pay a fine of five shillings to the society's treasury, or on refusal, shall be excluded.

II. The officers appointed to conduct the affairs of this society shall be as follows, viz. one President, one Treasurer, one Clerk, two Stewards, two Wardens, and such a number of committee-men as circumstances may require, agreeable to these articles. The president to be elected by a majority on each quarterly night, and to serve one quarter ; the old president to propose one member, and the two declining stewards each one ; and of which three, the society shall proceed to vote one, and the member who gets the greatest number of votes shall serve as president ; on refusal, to forfeit five shillings.—The stewards shall serve as they stand on the list of enrolment ; or, on refusal, to forfeit two shillings and six pence. The declining stewards to serve as wardens ; on refusal, to forfeit two shillings and six pence : and any member residing out of the town, who cannot conveniently attend to serve in any such offices, shall on every New Year's Day, pay four pence into the box, in consideration of being freed from such services. The clerk shall be chosen annually by ballot, on the first meeting in the New Year. Members to serve as committee men (on the admission of new members) as they stand on the list of enrolment ; but on every emergency, or particular case, a select committee of eleven members to be chosen by the officers in manner following, viz. the president

dent to choose three, the clerk two, the stewards two, and the wardens each one.

III. The office and power of the president shall be to take security from the treasurer, for the society's cash; to see that the room be furnished with all things necessary; to order a meeting of the society on any emergency; to see that every officer perform his duty, and if not, to bring them under a fine; to command silence; and on neglect of duty, he shall pay a fine of five shillings to the treasury, or be excluded.

IV. The office of the treasurer shall be to receive the society's cash monthly: to pay all sick members, and all other money which may be disbursed by the society whilst he is in office; to take and give satisfactory security to the president, for what money he may receive or lend out; to annually render in an account to the president of what cash he may have received or disbursed, during the last year, so that he may order the same to be printed and distributed amongst the members of the society, on the anniversary meeting; and on neglect of duty, shall forfeit five shillings to the treasury, or be excluded.

V. The office and power of the stewards shall be to take into the society all new members after the doctor's examination; to visit all sick members; to keep the whole society in good order; to command silence; to fine a brother for misbehaviour, according to the rules of the society; and on neglect of duty, shall pay a fine of two shillings and six-pence to the treasury, or be excluded.

VI. The office and power of the wardens shall be to assist the stewards in observing the orders of the articles, and grievances given to the society; and to fine any member or members who may be seen or heard breaking through any of the rules, which are or shall be hereafter made; and on neglect of duty, shall pay a fine of one shilling, or be excluded.

VII. The office of the clerk shall be to keep and regulate

late the society's accounts; and after the appointed time for the dismissal of the members of the society each night, shall make up his books for the night, and render in to the treasury what cash he may have received; to enrol each new member, after being approved of by the stewards and doctor, and to supply the same with a book of articles; to take an account of all fines, and receive the same from the stewards; and he being absent and failing to appoint a sufficient person to do his duty, within half an hour after the fixed time for the society's meeting, shall pay a fine of two shillings and six pence to the treasury: and for the performance of his duty he shall be paid quarterly by each member of the society two pence.

VIII. This society shall meet on the first Tuesday in every month, at the room appointed, from seven o'clock in the evening till half past nine, during the spring and summer months; and from seven till nine, during the autumn and winter months: and any member residing within the township of Workington, neglecting paying or sending his monthly money, within the hours above specified, shall for the first night's neglect, pay a fine of two pence to the treasury, for two successive nights six pence, and for three successive nights so neglected one shilling, or be excluded. Any member or members residing out of the said township, but within twenty miles of the same, shall pay up his arrears quarterly; or for the first quarter's neglect, shall pay a fine of two shillings and sixpence to the treasury, for the second quarter's neglect five shillings, or be excluded.

IX. That each member, on admittance, shall pay five shillings entrance, and eight pence for his book of articles; and continue to pay one shilling per month to the treasury, three pence per quarter to the doctor, and two pence per quarter to the clerk; and to continue a member eighteen months before he be entitled to any benefit from the society whatever.

X. That the number of members (exclusive of such as
may

may be superannuated) shall not exceed two hundred, and that no person shall be admitted as a member who is under the age of eighteen, and above the age of twenty-eight; and any member who shall hereafter be found guilty of theft murder, or such like criminal actions, he shall be excluded the society, without any benefit whatever; and it is moreover thought proper, not to admit into this society, any person of the following callings; viz. soldiers, sailors, miners, bailiff, or bailiff followers, or any of the embodied militia; and any member who shall hereafter become any of the same, he shall be excluded, except impressed or ballotted into the militia.

XI. That no person shall be admitted a member of this society, who is a member of any other of the same nature, and any admitted member hereof, entering into any other of the like kind, shall be excluded this society. And if it should be found out that any member has imposed upon this society, either by concealing his age, bodily infirmity, or any other circumstance contrary to any of these articles, and this discovery be made or proved within the space of eighteen months from the time of his admittance, he or they shall be expelled the society, and forfeit what money they have paid into the treasury; and no person shall be accused of such imposition after the eighteen months.

XII. Any person mindful to offer himself a member of this society, shall give notice to any member of the society, and deposit one shilling per month, until he be ordered to personally appear with a certificate from the doctor, stating his being sound, and fit to become a member of this society; and if the said person be then voted into the society, and do not enter himself and pay up his dues; before the expiration of three months, the deposit shall be forfeited to the treasury, and he not allowed to become a member from the time his deposit was received.

XIII. Every member having paid up all his dues and demands,

mands, agreeable to those articles, for eighteen months, from the time of his entrance, shall (if he fall sick, or be otherwise disabled from following his occupation) receive from the treasurer the sum of nine shillings per week, for the space of twelve months, if his sickness or ailment continue so long; and the steward or stewards shall visit such member twice a week, provided he reside within the township of Workington; and if the steward or stewards neglect making such visits, he or they shall forfeit two shillings and six-pence to the treasury, or be excluded: and any member fraudulently imposing upon this society, in any way whatever, shall on proof thereof, be for ever excluded the benefit of the society.

XIV. That if any member's sickness continue above twelve months, he shall, after that time, receive five shillings per week, as long as such sickness shall remain; and if such sickness, ailment, or old age render him incapable of following his usual employment for his support, he shall then in that case continue to receive five shillings per week, till the day of his death; and further, he shall be allowed the liberty, after his superannuation is decreed, of earning two or three shillings to himself, if he be able, besides by paying his monthly money regularly into the treasury, and making quarterly (if required by the officers) a declaration appointed for that purpose, his weekly allowance from the box; and if such member or members reside within the township of Workington, the stewards shall visit them at every opportunity, and make a report of the same to the president, giving him at the same time a true information of their state and case, as far as their observation and judgment can direct, without false accusation, or fraudulent connivance: or, on neglect of his duty, forfeit five shillings to the box, or be excluded.

XV. That if any member of this society reside out of the township of Workington, but in some part of Great Britain,

Britain, Ireland, Scotland, or the Isle of Mann, (having paid up his dues to the treasury), and shall be afflicted with sickness or ailment, so as to render him incapable of following his usual employment, he shall send a certificate, signed by the minister and churchwardens, or by a surgeon or apothecary, if any attend him, naming his sickness or lameness, and cause of the same; and if such sickness or lameness continue above one month, he shall for every month send a certificate, signed as the former, or it will be rejected; and any person's name being forged, or put to a certificate, without such a person's consent or knowledge, (on proof thereof), the member so doing shall be excluded. The postage of letters or certificates, sent by any member to this society, shall be paid, or they shall be rejected. And on the death of a distant member, the same allowance shall be made, as if then in Workington, on a certificate being first produced, signed by the minister and clerk of the parish, where such member may die, and testifying that his funeral was decent, and becoming a Christian.

XVI. If any member's sickness end in death, it is agreed that the sum of eight pounds be allowed from the treasury, and given to his widow, if he was married; but if the deceased member was unmarried, then the said sum of eight pounds shall be given to whom he may order, by his last will and testament, on their paying thereout his funeral expenses. And if any member be married, and his wife die before him, it is agreed that the sum of three pounds, as a part of the above eight pounds, be paid to the member, on the death of his wife, to defray her funeral expenses, and the remaining five pounds to be paid at his death as aforesaid, provided he continue a member of this society till his decease. It is further agreed, that as long as this society's fund does not exceed the sum of fifty pounds, each and every member shall pay one shilling on the death of a member, and six pence on the death of any member's wife;

wife ; and when the fund amounts to more than fifty pounds, and not exceeding one hundred pounds, then there will be a collection of six pence each on the death of each member ; and when the fund is found to amount to above one hundred pounds, then the whole (funeral expenses to be as above) to be taken out of the treasury.

XVII. That if any member of this society die within the township of Workington, it is agreed that every member then residing in the said township shall, on public notice being given, assemble at the club-room, one hour before the time of interment of the deceased brother, and shall from thence proceed to where the deceased brother is, and and to attend him in regular procession to the place of interment, and if any member die out of the township of Workington, and his corpse be brought to be interred in the said township, then the remaining members, residing in the said township, on having public notice of the same given, shall attend as before mentioned, and proceed from thence, in regular procession, to meet the corpse at the entrance of the town, and accompany it to the place of interment; and if any member die in the township of Workington, and his corpse be interred out of the said township, then the society, on being summoned, shall attend the said funeral, in regular procession, to a convenient distance out of the said township ; and any member residing in the township not attending when summoned to a funeral, shall for such neglect pay a fine of two shillings, or be excluded ; except it can be proved that such an absent member was either sick, or three miles out of town, at the time of interment.

XVIII. That a surgeon or doctor shall be appointed to attend the sick members of this society, who shall upon notice being given him by the stewards attend any member who may be afflicted with any sickness or lameness, provided the said member reside within the said township of
Workington,

Workington, or within two miles of the same; and shall furnish such sick member with suitable medicines and his attendance; and any sick member of this society, who may reside at a greater distance from the said township, on application to the surgeon or doctor, will be entitled to his advice and medicine, equally as if he resided in the town of Workington; and the said surgeon or doctor so appointed shall for such service well and truly performed, be paid from each and every member of this society, the sum of three pence per quarter; and on neglect of any member not paying the same, he shall forfeit six pence, or be excluded. The doctor or surgeon to be chosen by a majority of the society; and on the neglect of his duty, shall pay a fine of five shillings to the treasury

XIX. If any member of this society, by his irregular way of living, or by any notoriously vile practice, or unlawful means, after his admittance into this society, bring upon himself any distemper or maimment, every such member shall, upon a sufficient proof thereof, be excluded the society without any benefit therefrom; and any member being afflicted by any unlawful means, who conceals his true case, and receives his weekly allowance from the treasury, such member shall, on proof thereof within the space of twelve months, be excluded; and every member privy to such unjust practices, (who doth not immediately inform the stewards of the same) shall, on proof thereof, pay a fine of five shillings to the treasury, or be excluded.

XX. Any member or members being in this society eighteen months, and having paid up all his monthly dues and demands to the treasury, if he or they have occasion to leave the town, he or they shall give or send an information to the president then in office, where he or they purpose residing, provided he or they do return again within the space of twelve months, (healthy and sound) and paying

up all arrears, shall be received again into the society, without paying any new entrance-money ; and every absent member, residing twenty miles distant from the town of Workington, shall, on paying up his monthly dues and arrears every year's end, be entitled to every benefit of this society, the same as if upon the spot ; and any such absent member neglecting paying up his yearly dues, shall for the first offence pay a fine of ten shillings and six pence, or be excluded.

XXI. Any member or members being afflicted with either sickness or lameness, so as to render him incapable of working at his usual employment, and he receiving his allowance at the same time, such a member shall, if he have journeymen or apprentices employed under him, be allowed the liberty of superintending or ordering the same workmen to their duty, and in that case he shall be allowed his usual allowance from the treasury ; but should such member or members be found working themselves at their usual employment, or disguised in liquor, during the time they are receiving their allowance from the treasury, shall, on sufficient proof thereof, pay a fine of ten shillings and six pence to the treasury, or be excluded.

XXII. If any member be charged with a breach of any of these articles, or any crime these articles do not fully explain, it shall be decided on the first quarterly night following ; the stewards and wardens giving notice to each member when he pays his money ; and every member refusing to give his vote, or leaving the room before such matter be decided, shall forfeit six pence ; and any member refusing to keep silence, when demanded, while such matter is in hand, shall pay a fine of two pence, and quit the room in peace, without offering violence to any member, or he shall forfeit one shilling to the treasury. Or if any member accuse another with a breach of any of these articles,

articles, and cannot (when called upon) make his accusation good, he shall pay a fine of five shillings to the treasury, or be excluded.

XXIII. No member or members shall abuse any other members of this society, during club-hours, by any scandalous language; but if any member have any grievances against another, the same shall be represented to the committee; and if either the offending or defending members reject the award given by the committee, he shall forfeit five shillings, or be excluded.

XXIV. If the president, stewards, treasurer, wardens, and all others in office, do not attend at the club-room within half an hour after the time specified in the 8th article, such officer or officers shall on neglect thereof pay a fine of six pence, except he be sick or lame, or out of town at the time, or appoint a deputy to act in his absence; and no member in office shall, without leave from the president, be allowed the liberty of leaving the room, until the clerk's book be settled for the night: such offending officer shall, for the first offence, pay a fine of six pence, or be excluded.

XXV. Any matters of consequence which any member may have to lay before the society, on his communicating the same to the president, he shall order it to be decided on the first quarterly night following; and any new articles or by-laws, proposed to the society, shall be approved two monthly nights, the one a quarterly night, before it shall become binding or of any force; but provided it should meet with the approbation of the majority, on the two monthly nights, then the same shall be of equal force as if here printed. The clerk drawing a true copy of the same, and placing it in the most conspicuous part of the room, that every member may be acquainted with the same.

XXVI. Each and every member of this society shall, on every anniversary of this institution, on the fourth day of June, in every year, (excepting it fall on a Sunday, in

which case, it is to be held the day following,) pay one shilling and six pence to pay the expense of a feast which shall on that day be provided for the society, at such a place as the majority may determine on the preceding monthly meeting; and all the absent members' money shall be spent, at the said place and time, by the members then present. And each member shall attend at the same place by ten o'clock in the morning, to go in procession to such a place of worship as shall have been agreed upon the preceding meeting, where a sermon shall be delivered suitable to the occasion, of which previous notice shall be given to the minister appointed to preach the same by the president, who is authorized by this society to procure what may be wanted, as agreed to by a majority, for the said procession, the expenses of which to be paid out of the box. The procession to be conducted in the following manner, viz. the wardens with white staves; the president and doctor with sashes, &c.; the two stewards with sashes, keys, &c.; the clerk with sash, roll, pens, and key; and then the rest of the society, two and two, according as they stand on the list of enrolment; each member being decent and clean, bearing a white rod, and having on white stockings and white gloves. And every member residing in Workington, or any where within ten miles of the said township, shall attend the said procession to and from such place of worship, or pay a fine of five shillings, or be excluded, except he be then upon the box, or can give a satisfactory reason for absenting himself; of which a majority shall determine on the first quarterly night following.

XXVII. That there shall be no addition nor diminution of these articles, without the consent of the major part of the society: nor shall this society be dissolved while any three members hereof do remain; and if any member propose to have the society broken, or to have the money divided, he or they so offending shall pay ten shillings and six pence, or be excluded.

XXVIII.

XXVIII. It is further agreed, that each and every member shall sign an obligation for the observance and performance of all and every of these articles, and any person that is admitted shall sign the same.

ARTICLES OF BEHAVIOUR.

ART. I. THAT every member behave decently and discreetly to each other, especially to the president and other officers for the time being, giving them the title of their respective offices, and the honour and respect due to their several stations ; or for each offence, forfeit two pence to the treasury.

II. That no member shall come into the society's room intoxicated with liquor, or use any obscene discourse, or lay wagers ; nor shall any member sit with his hat on, during club hours, (except the president,) on forfeit of two pence for each offence.

III. That any member using any provoking language, or gestures, or who shall give the lie, or use quarrelsome behaviour to a brother in the society's room, shall forfeit two pence for each offence, and shall ask pardon of the offended party, before the president and stewards ; or be excluded.

IV. That if any member shall (in the society's room, at the anniversary of the institution, or wheresoever the society may be assembled) in anger assault another member therein, provoke, strike, or cause to be struck, without a very sufficient reason, (which reason shall be determined by a committee of eleven men, chosen for that purpose,) shall forfeit five shillings to the box, and shall ask pardon of the party offended, and make proper submission before the president and the other officers, or suffer exclusion ; or if at any time a member shall run down or speak disdain-

fully of any other member of this society, without a just cause, he shall forfeit two shillings, or be excluded.

V. That if any member in the society's room presume to curse or swear, or tell a lie, to the prejudice of this society, he shall forfeit six pence, or be excluded.

VI. That any person recommended to join this society, shall be desired, by the president and stewards, to withdraw till the matter be concluded upon by the society.

VII. That during the stated hours, any brother mindful to move any thing in behalf of himself or another, shall stand up to ask leave of the president and stewards to be heard; and when leave is granted, such brother shall be heard without interruption, until he hath ended his discourse; and any brother may second such motion, or with leave reply to it; and only one shall speak at a time, or forfeit two pence to the box; and if any doubt shall arise, the president and stewards shall lay the same before a committee, who shall determine the matter; and whoever finds fault with the said determination, shall forfeit one shilling, or be excluded.

VIII. That if any member shall declare who is for or against any person, on any trial or reference, he shall forfeit five shillings to the box, or be excluded.

IX. And lastly, that this society and agreement shall subsist, and be binding and conclusive to all parties comprehended therein, according to the true intent and meaning of them, whilst any three of the said society are of one mind to continue the same, for all the ends and purposes aforesaid; and according to their several stations, shall receive, pay, and be paid, sue and be sued accordingly, so far as is consistent with, and agreeable to the rules of this society, and the laws of the realm.

CUMBERLAND, } At the General Quarter Sessions of the Peace
(to wit) } of our Sovereign Lord the King, holden at
Cockermouth, in and for the county of Cumberland, on Mon-
day the fourteenth day of January, in the year of our Lord 1799,
before *James Clark Salterthwaite, John Kay*, Esquires, and others
their fellows, Justices of our said Lord the King, assigned to keep
the peace of our said Lord the King, in the same county, and
also to hear and determine divers felonies, trespasses, and other
misdemeanours in the same county committed :

Ordered—That these Rules and Regulations be confirmed.

By the Court,

J. HODSON,

Deputy Clerk of the Peace.

TABLE OF FORFEITS.

Art.	£.	s.	d.
1. For attempting to remove the society -	0	5	0
2. For refusing to stand president, when elected	0	5	0
— For refusing to serve as steward -	0	2	6
— For refusing to serve as warden -	0	2	6
3. For the president's neglect of duty -	0	5	0
4. For the treasurer's do. do. -	0	5	0
5. For the stewards' do. do. -	0	2	6
6. For the wardens' do. do. -	0	1	0
7. For the clerk's do. do. -	0	2	6
8. Town's members' neglect of payment first monthly night -	0	0	2
9. Do. do. for the second month -	0	0	6
10. Do. do. for the third month -	0	1	0
11. Country members within 20 miles, for the first quarter's neglect -	0	2	6
12. Do. do. for the second quarter's neglect	0	5	0
13. For the stewards' neglecting to visit the sick	0	2	0
14. For the stewards' neglecting to visit the superannu- ated members -	0	5	0
z 4		15.	For

Art.	£.	s.	d.
15. For not attending the funeral of a deceased brother	0	2	0
16. For neglect of quarterly payment to the doctor	0	0	6
17. For the doctor's neglect of duty	0	5	0
18. For conniving at any fraudulent practice in any member	0	5	0
19. Any member residing 20 miles distant on neglecting to pay up his yearly dues	0	10	6
20. Do. do. being seen at work, or drunk, &c. when on the box	0	10	6
21. Do. do. departing the room when any particular matter is in hand	0	0	
— Do. do. refusing to keep silence, when ordered	0	0	2
— Do. do. not quitting the club-room in peace, when ordered	0	1	0
22. For false accusation	0	5	0
23. For rejecting the award given by a committee	0	5	0
24. For the president, stewards, treasurer, &c. not attending in due time	0	0	6
25. Officers leaving the room, without leave from the president	0	0	6
26. For not attending the anniversary procession	0	5	0
27. For proposing to break the Society, or divide the cash	0	10	6

SCHOOSE FARMING SOCIETY.

	Collections.			Disbursements.		
	£.	s.	d.	£.	s.	d.
Year 1806 - - -	19	3	6	4	0	0
1807 - - -	22	1	4	9	0	0
Balance in the hands of Mr. Curwen	.	.	.	28	4	10
	<hr/> £.41 4 10			<hr/> £.41 4 10		
	<hr/>			<hr/>		
	£. s. d.					
Contributed by the Society - - -	31	14	6			
Mr. Curwen's 3-10ths proportion per rules	9	10	4			
Society's fund, 31st Dec. 1807 -	<hr/> £.41 4 10			<hr/>		

RULES AND ORDERS to be observed by an **AGRICULTURAL SOCIETY** of the Servants and Labourers employed at the Schoose Farm, Workington.

INTRODUCTION.

To the Agricultural Servants and Labourers employed at the Schoose Farm.

THE first object which engages the time and attention of the bulk of mankind, is to provide for the necessities of the present moment. But a small proportion of those who are in possession of youth and health think of the morrow, or make any provision for the time when old age will come upon

upon them ; or when sickness, or the accidents to which human nature is exposed, will put a stop to their labours, and in consequence to their usual means of subsistence.

Engaged as you are in laborious pursuits which occupy so much of your time, and willing to believe that sufficient unto the day is the evil thereof, you never look beyond it, or lay up in store for a time of need, what could be spared from your present earnings. Is it not, then, the duty of those materially benefited by your meritorious exertions to think for you, and to provide the means of sheltering you from miseries which are hid from your view ? Can any means be devised more likely to effect this purpose than the establishment of a Benefit Society ? Wherever they have been established, they have not failed of affording the most material assistance to all the members of them ; but their beneficial effects have been but partially experienced ; the great bulk of the labouring community have either overlooked or undervalued the advantages of them. In this neighbourhood, where so much general benefit has been derived, I should hope few arguments are necessary to prove the advantages that will flow from a new institution of a similar nature. Permit me to ask any one of you who has lived in tolerable comfort, What support would the most liberal parochial relief afford you ?—Is it nothing to be subject to control ?—Does dependence inflict no wound upon a feeling mind ?—Such, however, must be the situation of those who live from hand to mouth, and have made no provision against sickness, misfortune, or old age.

Wise, just, and humane, are the poor laws of Great Britain, which are exclusively confined to this happy country. These are founded upon the principle, that the earth shall provide nourishment for every human being : but it assumes also, that none shall eat the bread they do not earn, but such as are incapacitated by age or infirmity.

fruity. Whoever avails himself of this provision, without exerting himself to the utmost, commits a fraud upon the public.

With this view of the subject, and most sincerely interested in the happiness and comfort of every individual employed in a pursuit which engrosses so much of my attention, I earnestly intreat you to make provision for yourselves, by an Agricultural Club: and to evince the sincerity of my zeal for its success, I shall cheerfully contribute three-tenths to whatever sum may be collected, subject, however, to the following regulations:

RULES OF THE AGRICULTURAL SOCIETY.

ART. I. EVERY member shall pay three pence per week to the fund; and must have contributed six months, to be entitled to relief.

II. No relief to be allowed till after the expiration of one week's confinement from sickness; a certificate from the medical attendant will be required.—Sickness or accidents, arising from drunkenness or irregularity, will be excluded from any benefit or relief from the society.

III. Ten shillings per week to be allowed in cases of sickness, for twelve weeks; and seven shillings per week afterwards, till the member be able to resume his employment. Provided always, no person shall be entitled to receive at any one period above ten times the amount of what he may have contributed to the fund, together with Mr. Curwen's proportionate allowance on the same, for any sickness or incapacity, without the consent and approbation of two-thirds of the whole society.—Whenever the funds of the

the society will permit, an extension of relief will be granted.

IV. Any person quitting Mr. Curwen's employment may continue a member, provided they have not been dismissed for improper behaviour.

V. Any person under forty years of age may become a member. A committee of six persons to be chosen annually to inspect the accounts, and to determine upon all occurrences that may arise; one of whom shall in his turn visit and report upon the state and situation of all sick members.

VI. Any person neglecting to pay his contributions for three months, to be excluded. Mr. Curwen's principal agent, in his absence, to act as president. The contributions to be paid at the office.—Accounts to be published annually.

VII. Mr. Curwen agrees to pay three-tenths of the whole sum contributed. In case of the death of any member, the society to allow his widow and children five pounds for defraying the funeral expenses, provided the funds amount to thirty pounds; if under thirty pounds, two guineas and a half.

In addition to the said society's rules; no person to be hereafter employed in labouring work, who will not consent to pay three pence per week into a fund for affording casual relief. The relief from this fund to be regulated by the necessity of each case, and the state of the funds; Mr. Curwen's head agent, in his absence, to regulate the same; and to have the same allowance from Mr. Curwen.

Out of the number of labourers employed, a very great number are strangers, destitute of any resource in cases of accident or sickness; in order to provide against the hardships incidental to such persons, this regulation is instituted.

Labourers'

Labourers' Society at the Schoose Farm.

	Collected.			Disbursed.		
	£.	s.	d.	£.	s.	d.
Year 1807	17	7	1	2	0	0
Balance in the hands of J. C. Curwen, Esq.	.	.	.	15	7	1
	<hr/>			<hr/>		
	£.17	7	1	17	7	1
	<hr/>			<hr/>		

	£.	s.	d.
Contributions by the Society	13	7	0
J. C. Curwen, Esq's 3-10ths proportion	4	0	1
	<hr/>		
	£.17	7	1
	<hr/>		



GENERAL OBSERVATIONS.

So much has been said and written by the statesman, the philosopher, and the theorist, on the important subject of the poor laws, and such a variety of schemes have been submitted to the public, without their having hitherto produced any practical benefit, that it would be the height of temerity to hope any thing I could offer would be more fortunate. I am anxious, however, to detail the result of some years experience. The inferences I wish to draw will meet with more or less attention; according as they shall appear to be just conclusions from established facts.

It is a melancholy avowal how little has been done in the way of improving the condition of the indigent poor, notwithstanding the numerous projects which at different periods have been submitted to parliament. Thus we suffer the evil to increase with rapid strides, until at length it may be past all means of redress.

To introduce my observations with proper effect, I have given in the preceding pages a correct statement of the rates levied for the support of the town of Workington, as well as an account of the different Benefit Societies, the state of their funds, and the whole amount of their respective contributions; and the following table will exhibit the results in a striking point of view:

Cost

Cost of maintaining the sick and aged poor in the		£.	s.	d.
town of Workington		-	-	600 0 3
		£.	s.	d.
The Colliers' Society per ann.	-	295	0	0
Sisterly Society	-	171	13	0
Honourable Society	-	90	11	3
Provisional Society	-	81	0	0
Schoose Farm Society	-	39	8	5
Friendly Society	-	59	4	2½
		<hr/>		
		£ 736	17	1½
		<hr/>		

Taking the estimate at 736*l.* 17*s.* 1½*d.* as a fair average of amount, in the last fifteen years, the total sum of voluntary contributions will be 10,956*l.* 16*s.* 10½*d.* The whole of the sums raised by the poor-rates, but applied to various objects not strictly applicable to the poor, up to the last year, will not exceed 8550*l.*

That a partial subscription of individuals (aided, I will admit, by the promoters of these Societies) should have raised so large an annual sum, will appear a matter of astonishment to those who have not much reflected upon the subject, but it must be a matter of delight to all.

And yet great as the amount is, and exceeding the whole sum expended by the town for supporting the necessitous poor, I can confidently assert, that had the measure been general, not less than double this sum would have been produced. Had the different proprietors of considerable works established in the town viewed the beneficial consequences of the plan in the same light with myself, and introduced it and supported it among those in their employ, we should

at

at this moment have raised out of the earnings of the mechanic, the collier, and the labourer, classed in their different societies, a gross sum amounting to little short of 1500*l*. I cannot resist indulging in this pleasing idea of what might and ought to have been fully realised. The township finding itself relieved of so great a proportion of burthen, would doubtless have contributed a third or other considerable part of the whole collections, in further aid of the Societies, and as an encouragement to their meritorious perseverance and continuance.

By this means we should have had near 2000*l*. per annum, to be laid out in the recovery of the sick, the support of the declining, and the education of youth ; and surely such an example of right-minded exertion would have acted with the happiest effects on the hopes of other individuals ; and what honour could not do, the dread of shame would have brought about. Thus, then, they who depended upon industry and health for support, would in their respective classes have contributed to the relief of others, under the assurance of an equal return ; and none but the aged, the infirm, and the destitute, would have been left as a charge to be supported by the bounty of the parish. A circumstance of trifling notice, but important in its influence on the feelings of a body of people, must not be omitted ; the yearly celebration of the first formation of their respective Societies, the joint attendance on public worship, the dining in common with their friends and patron, the passing the yearly accounts, and choosing a new committee and other

officers for the management of the affairs of the Society from among themselves, are so many charms to bind and engage man to man, and raise him in his own estimation.

As a further proof of the benefit resulting from Societies, I beg to state the following circumstance. In the last year some afflictive losses were sustained at sea, and several poor women bereft of their husbands, and left with numerous families to bewail their misfortunes, without any means but their own honest endeavours for the support of themselves and families. A subscription of nearly a hundred pounds was obtained for them, which, under the circumstances of the town, and the frequent calls upon their humanity, was liberal. Contrast this with the situation of the afflicted belonging to these Societies, where eight members received a larger sum drawn from their own funds, which were equal to the continuance of the same support so long as the necessity continued. Charity has its limits, and the relief diminishes in proportion as the pressure increases.

That such a plan might be made general, under parliamentary restrictions, and accompanied with proper checks, is what I cannot too positively affirm; but I shall submit at some length the grounds of my opinion.

That no plan is without objections, and that *folly and prejudice* is ever more prone to find fault than to approve; as an example, I should quote the case of Mr. Bolton, of Soho, Birmingham, who some years ago offered the parish, in which his extensive works
are

are situated, that if they would exonerate him from paying to the poor-rates, he would guarantee them from any charge from persons in his employ. The offer was refused, which I consider as highly unfortunate, as I conceive it might have led to very important national consequences.

It is not enough barely to satisfy the wants and alleviate the sufferings of our fellow-creatures; we must advance farther; and the mind must be an object of our care as well as the body. The near alliance of vice and misery to mental degradation, and the dreadful moral effects of torpid indifference and hopeless poverty on the lower orders, (evils of late greatly increased and still increasing daily) satisfactorily prove, that whatever has already been done by law, has been founded on erroneous principles, and that something less complicated in its system, and more consentaneous to the great springs and motives of human action, must be speedily attempted. I would not hastily pull down and destroy what is even avowedly imperfect and insufficient to its ends, but I would inquire whether some plan might not be so constructed, as to supply its place, and in time render its application altogether useless.

Is the character of those receiving parish aid such as is suited to men either in a physical or moral point of view? The spring of hope is weakened, and the inducement to exertion palsied, the feelings of independence lost or destroyed, and the kindest endearments of life not unfrequently torn asunder by the severe and indiscriminating modes of relief which are afforded under

der the present system ; and to aggravate the malady, the burden of inefficient contribution bears down all before it, and increases in an inverse ratio to the ability of sustaining it.

The extent of my wishes is to collect in one point of view the evidences of successful experience, and the results of candid reasoning, in support of a measure which appears so replete with advantages ; and I shall be highly gratified should I be able to draw the attention of men more accustomed to think profoundly on these questions than myself, to the full development of all its consequences.

The soundness of the principle once established, the arrangement of the details, when conducted by the collective wisdom of the legislature, will be a work of easy labour, admitting of occasional revision and amendment, until the plan shall be rendered fully complete. There are, however, two or three heads of detail, on which I wish to offer a few remarks. Malthus's plan for the abolition of the poor laws, the education of poor children, the situation of the manufacturing poor, and the parochial burthen of illegitimate offspring. No commendation of mine can add to the merit of Mr. Malthus's valuable work ; but it is just to avow, that I can see nothing either of cruelty or injustice in the principle of imposing a check upon *unprovided* marriages, rather than affording a direct encouragement to them. A restriction of this nature connected with the measure of benefit societies, would have a powerful effect on industry and good morals ; for, by enforcing upon all classes the justice and absolute

absolute necessity of their providing for their own support, and at the same time holding out the means of their making such provision for all the exigencies of a future family, you establish principles on their minds highly favourable to virtue and order, of the rising generation, and lay the basis of an independent and adequate support, solely arising from their own industry, and productive of the happiest and most extensive consequences to the community at large.

With the capacity of agricultural improvement by inclosures and otherwise, which the empire possesses, a supply of food for a doubled population might be certainly produced ; and by keeping the wages of labour in a constant ratio to the supply of victual, the progressive increase of population would sustain no checks whatever, and would afford the surest proof of the solid prosperity of the country.

And in the case of a nation's arriving at a maximum of provisions, (an evil which we need not greatly apprehend) it is quite obvious that any augmentation of numbers would produce a proportionate degree of misery to the whole society, and that artificial checks would not be required, when so many natural ones would arise to keep down and repress an excess of population.

That spirit of manly independence and honest pride which disdains to subsist altogether on charity, is still to be found in some degree in our northern counties ; and I myself have witnessed the greatest exertions used (and which under a better system must

have been successful) to avoid the disgrace of a work-house, the sale of their little all, and (as they termed it) the consummation of their misery. To revive a similar spirit throughout every part of the kingdom, by giving a stimulus of exertion, and opening the means of self-support, must be the anxious wish of every friend to his country. What, I would ask, in the best periods of our history, has given rise to the superior prowess of our arms, or to the enterprise and extension of our commerce? What has led to the perfection of our manufactures, but the genius of an independent people governed by equal laws, and alive to every impulse of hope, and whose character has been formed on the united basis of virtue, morality, and general independence?

It has been truly said, that in proportion as we advance mankind in their own estimation, we stimulate them to deserve that of others; and I may add, that by bettering their moral condition, and proving that they have something valuable at stake in the common danger, they will be found, both as subjects and soldiers, more attached, resolute, and courageous, than the enslaved multitudes who have nothing to fear or to hope, to lose or gain, by any change of masters.

If this train of reasoning be correct, (and it might be carried much farther,) there are strong grounds made out for the application of the old scheme of Benefit Societies as a public measure to the nation at large, and with the best hopes of success. What has

has been successfully done on a small extent, may, by proper management, and under the sanction of Parliamentary superintendence, be equally well managed on the largest scale ; and in its success the interests of every class are directly involved.

The landlord and the farmer, the great manufacturer and the proprietor of fixed and local capital, would make a common cause in supporting a plan so favourable to the amelioration of the lower orders, and at the same time diminishing the pressure of their rates ; nor can there be a doubt of the labouring poor themselves being very quickly satisfied of the wisdom and policy of the measure.

A very sensible and judicious Pamphlet which I have recently seen, published as far back as the year 1786, for rendering the poor independent of public contribution, founded on the basis of Friendly Societies called Clubs, does the philanthropic author (the Rev. T. Acland) the highest credit ; and is truly valuable from the Letter and Table of Calculations prefixed to it by the celebrated Dr. Price,

On the practicability of a general scheme of this sort, and on its adequacy, together with the provision already made of hospitals, alms-houses, &c. the Rev. Gentleman offers many judicious and sensible observations ; and then adds, “ but how, it may be asked, is this universality of subscription to be brought about ? For my own part, where it for me to determine, I should answer roundly, by the authority of Parliament ; since it is surely as equitable to tax a poor man 8s. 8d.

a year in order to secure him a comfortable provision against all the difficulties that may befall him through life, as it was to tax him at 6s. a year for the maintenance of those roads through which he has seldom or ever any occasion to travel."

He imputes the failure of the legislative experiment made in the county of Devon to some well-meant but inconsiderate clauses introduced into the Bill, and not to any defect in the principle; whence, as he justly infers, the "argument of parliamentary approbation returns with undiminished force." In the statement of his plan, the refutation of objections, and the salutary provisions suggested against fraud and indolence, he has given us a most useful Essay on Benefit Societies; and it were to be wished that this little tract should be more generally known.

I feel tempted to introduce a part of Dr. Price's Letter and his Table of Calculations, in confirmation of the opinion which, under every difficulty of prejudice and secret opposition, I have acted upon for 25 years.

"I have considered with much attention your plan for making a general provision for the poor. It is impossible that the principle on which it is founded should not be universally approved; nothing being more plainly equitable and reasonable than that the poor, while young, and in health and vigour, should be obliged, by small savings, to contribute towards their own support when disabled by sickness, accident, or age.

"This

“ This is a case in which the powers of compound interest may be applied with the greatest advantage, as will appear from the following calculation :

“ A body of 48 poor people aged 20 (and kept up to this number by admissions at 20 or less) may, if they will save out of their wages but 2*d.* per week, and this saving is properly improved at no higher interest than 3*d.* per cent. provide for themselves an allowance of 2*s.* per week for life, should they survive the age of 65 ; and also an allowance of 4*s.* per week during incapacitation by sickness or accident before that age ; supposing one of them (that is a 48th part) to be always so incapacitated.

“ Your plan, after the first year, requires all the poor to become contributors, either at, or before, or very soon after the age now mentioned ; and as far as it includes such contributors, I cannot doubt of its sufficiency for its own support, without any aid from the poor-rate, provided only care is taken to improve properly all surplus-money. I shall also have no doubt of the competency of your plan, were it at its commencement to admit all under 30, or even 31 ; provided that for ever afterwards it admitted none whose ages exceeded 21, or 22. But after 31, the contributions of the lower classes in your plan become deficient ; and from 50 to 55 they are extremely so, as will appear from a table I have given below. But there are in the plan some advantages which probably will more than compensate this deficiency ; particularly the entrance-money required of all turned of

35, the gratuitous subscriptions, and the contributions of the highest classes, which you have so contrived as to exceed greatly the value of the allowances promised. It is impossible to discover what the proportion will be of the numbers in these highest classes to the numbers in the lowest classes; perhaps it may not be very considerable, the lower people in every state being vastly more numerous than the higher. But there is reason to expect that this proportion may at least be considerable enough to compensate the deficiency I have mentioned. Should it however fall short of this, the only consequence will be, that the poor-rate, which would have been otherwise almost annihilated, will be obliged to bear a small part of the burden now upon it. In short, it seems to me that your plan has a tendency to do the greatest good, by affording, in the best manner, the most agreeable and useful relief to the poor, by encouraging frugality, industry, and virtue among them, by promoting the population of the kingdom, and removing many of the evils which attend our present poor-laws.

“ TABLE,

" T A B L E,

" Shewing the Value, in Weekly Contributions, of the Weekly Allowances for Old Age, and for Sickness, in Mr. ACLAND'S Plan.

Life Allowances payable weekly by Mr. Acland's Plan.				Weekly allow- ances for sickness and acci- dents.	Value in weekly contri- butions for life.	Value of Mr. Acland's Plan.			
Subscription beginning at the age of 20	s.	d.	after 65 &	s.	d.	after 70	s.	d.	d.
	1	0	—	1	6	—	4	1½	2
	1	3	—	1	9	—	6	2½	3
	1	4	—	1	10½	—	8	3	4
Ditto 35	1	0	—	1	6	—	4	2½	2
	1	3	—	1	9	—	6	3½	3
	1	4	—	1	10½	—	8	4	4
Ditto 48	1	0	—	1	6	—	4	3½	2
	1	3	—	1	9	—	6	3½	3
	1	4	—	1	10½	—	8	4½	4
Ditto 50	1	0	—	1	6	—	4	5	2
	1	3	—	1	9	—	6	5½	3
	1	4	—	1	10½	—	8	6	
Ditto 55	1	0	—	1	6	—	4	6½	2
	1	3	—	1	9	—	6	8½	3
	1	4	—	1	10½	—	8	9½	4

The importance of education to every class of society, to qualify them as men and subjects to fulfil their respective duties, is too clearly established to require the support of argument; and scarce any thing remained to be advanced, until the system of Bell and Lancaster made its appearance, and excited a general sentiment of encouragement and applause:

" Train up a child in the way he should go, and when he is old he will not depart from it,"—is a maxim

maxim as worthy of the attention of the statesman, as of the friend of humanity; nor can I entertain a shadow of doubt but that every objection to the instruction of the lower classes (in all essential points) may be resolved into motives of unworthy prejudice, or may be traced to an erroneous application of the mode of conveying knowledge.

It is not merely the technical arts of reading and writing which are to be acquired to qualify the young and inexperienced to discharge the duties of life, and fulfil the ends of their calling; the moral character must be formed by long-acquired habits of obedience, and a sense of right and wrong be instilled not less by example than precept; and to attain these objects, the motives of inducement are to be sought for in the mind itself, in the disposition, the enthusiasm, and the emulation of youth. Hence it is that the plan of Mr. Lancaster is fraught with genuine philanthropy, and for what he has already done he deserves, in an eminent degree, the thanks of every honest man. Let him who doubts of the value of moral education propose a better foundation of support for the edifice of society; let him who connects submission with deep-rooted ignorance, trace the horrors of cruelty, and the unappalled scenes of vice, to their actuating causes; and he will see the intimate connection of reason and virtue with the happiness and good order of the great family of the world. This, in my estimation, was the best feature of the Bill proposed in the last session of Parliament by a very respectable gentleman: and I shall rejoice to see a school in every parish

parish in England, established or modified according to the principles of this excellent plan ; where economy, and a saving of time, are equally objects of attention. And how easily might this be connected with the establishment of Benefit Societies, and supported at the joint expense of the parish, the society, and the contributions of the humane ?

I feel the strongest persuasion that all my past exertions have only contributed to alleviate misery, not to stop the evil at its source. After having passed through the greater and most active part of life, I have to begin afresh. Early education presents the only rational grounds for hoping to benefit the condition of the mass of the people. From what I have seen at Mr. Lancaster's school, and the military academy under the direction of Dr. Bell, I am satisfied that were the plan made general, it could not fail of success in a generation or two. Within the last twelve months, I have succeeded in establishing two schools, one for boys, the other for girls. The present numbers amount to three hundred ; as soon as I have completed the building of my school, I have no doubt of doubling the number. My wish is to combine industry with learning. I hope to be able to make the greatest part of the children earn sufficient to pay for their schooling, books, &c. and to contribute a part of their clothing. Each child pays 1*d.* per week to the master, and a half-penny for books. I would carefully exclude the idea of dependence from their young minds, and instil the pride of being from their own exertions as little burdensome as possible even
to

to their parents. With this view, a part of the boys are during summer daily employed at the Schoose Farm. Each detachment is under the direction and control of officers, with superior pay, who are amenable for the conduct and diligence of those under their care. If they fail to report any improper conduct, they loose their situation. The change already produced in the behaviour of the children is striking. Civility and attention has taken the place of brutality and rudeness. On separating from school, they are formed into companies and marched home with the utmost regularity. Thus order and discipline are learned in a shape which pleases the mind ; inclination induces them to yield a ready and willing obedience. What may be the fruits of this system, we may gather from the influence it has already had ; for I am assured by numbers of their parents, that their conduct at home is quite different to what it was. All parents seem emulous to have their children taught, and, I think, very shortly, it will be considered a disgrace to such as do not give some education to their offspring. The scholars regularly assemble every Sunday morning, and proceed to their different places of worship. Their orderly and regular behaviour calls forth sentiments of admiration and approbation from all who see them. Six months ago not one in twenty of these children ever thought of complying with the duties of the Sabbath. It is now become a disgrace to be absent from Divine Service. What is now effected by shame may, I trust, as they advance in life, be followed from principle. If so trifling an expenditure

ture of money, and the sacrifice of so small a portion of time can produce what bids fair to have such great and important results upon the future happiness of hundreds, who that has the power when he has once seen, or been made sensible of the effect, would hold himself excusable in not adopting the plan? I have more pride and pleasure in this institution, than from any thing I possess, or ever accomplished in the whole course of my life. My only regret is, that I have begun it so late.

Conceiving a statement of the probable expense as far as I am enabled to make it may contribute to promoting the establishment of schools upon the same plan, I have peculiar satisfaction in detailing it. Which will demonstrate at how small an expense so material a benefit may be rendered to the rising generation.

The splendid statements annually presented to Parliament of the flourishing state of the country, clothed and tricked out as they have been with all the pomp and fascination of commanding eloquence, whilst all was silence on the rapidly increasing progress of pauperism, have always impressed me with apprehension rather than with confidence; because that evil becomes doubly oppressive, and can scarce be avoided by any after care, against the approach of which we wilfully shut our eyes.

Within these last twenty years, (these years of commercial speculation and unbounded encouragement of manufactural industry,) the number of paupers has been, I believe, more than doubled, and the increase

increase of rates proportionably advanced. A melancholy picture indeed, where one-tenth of the whole population subsists on charity? But may it not have been aggravated by injudicious measures? And is there no remedy that can be found to arrest its further inroads? We will inquire a little into the nature of this evil.

The overwhelming burden which a parish necessarily sustains from the failure or even temporary stoppage of a crowded manufactory situated within its precincts, is the strongest argument than can be offered for the introduction of societies of associated insurance among this numerous class of persons. The manufacturer and mechanic of almost every description, whose wages so greatly exceed (perhaps more than double) those of the labourer, should be compelled to appropriate a weekly portion of their wages as a common provision against the casualties of their situation; and to this fund, the proprietor ought, in all reason, to make a liberal contribution, for can it be just that one should be enriched at the expense of the health and the morals of many of his fellow-creatures?—or can that principle be sound which produces in its application the unrestrained indulgence of every passion, and which leaves as a charge upon agricultural industry, the worn-out and enfeebled instruments of commercial avarice?

Where wages are from 18s. to 30s. the deduction of 1s. per week could not materially affect the individual or his family; and were the proprietor to contribute at as low a rate as 3d. per week for every man
in

in his employ, a large collection would be raised ; and if the annual surplus were placed out at compound interest, an adequate provision would be formed for their relief under the pressure of sickness or other misfortune.

I cannot but view the labourer as the natural inhabitant of the parish, and the manufacturer as a kind of interloper brought into it by the favourable local circumstances of a canal or a colliery, and therefore these latter should do something towards their support under the infirmities of life, or the untimely effects of vicious habits. I argue this point strongly, because such has always been my view of the subject ; and such is the principle which gave rise to the first Societies established in Workington.

It may not be unimportant to offer a calculation of the numbers thus employed, and of the amount which a proportionate rate of contribution would produce :

Two millions of manufacturers, artificers, &c. at	}	£.
a weekly payment of 1s. would give per ann.		
Proposed contribution of proprietors - -		5,250,000
One million of agriculturists, at 6d. per week -		1,312,500
And one third of present poor cess - -		1,312,500
		1,700,000

The gross total of which affords the immense sum of £9,575,000

applicable to the alleviation and comforts of the poor, and which has hitherto been in a great degree squandered away in idle thoughtlessness, and at the resorts of intemperance, or lost as to its amount in the waste of valuable and productive time.

There is one description of unfortunates who enter into life with all the stigma of their parents' misconduct, and for whom the benefits of education are more especially requisite to preserve them in the paths of virtue, and in the principles of religious obedience, who are most commonly destitute of every care and attention, and for whose support no prospective provision can be made without its operating as an encouragement to vice. The laws compelling the parents to provide for illegitimate children, or punishing those who cannot, as far as they extend are salutary; but justice and policy call upon the public to interpose, and to discharge those duties of which they are bereft. I should propose that the nation should have the charge of their education, and that the boys should be brought up and instructed on a similar plan to the Marine Society, with a view to their being employed in the public service of their country.

I am happy to find government have signified their intention of taking children from the parishes, and bringing them up in the navy, and other public services. I am friendly to any plan that can emancipate them from being sent to manufactories. I never was more shocked or surprised than by seeing near a hundred children of both sexes, none of them above twelve years old, collected from the poor-houses in the metropolis, on their road to a new manufactory in the North, destitute of all friends, uneducated, nay worse, with for the most part bad examples before them. What must not be expected to be the issue? They cannot be expected to escape the baneful influence of
vice

vice and worthlessness; and after having sacrificed the season of instruction, and arrived at maturity, they are to be found turned adrift, without a trade by which they can earn an honest livelihood. To be manufacturers for all the world, by such means, cannot produce lasting prosperity. The sooner we are confined to the supply of our own immediate wants the better, inasmuch as the evil will become so much the less considerable, if not wholly removed.

	£.	s.	d.
Salary to Master	52	10	0
House Rent	5	5	0
Occasional presents	5	5	0
Mistress	21	0	0
House	3	0	0
Assistant	5	5	0
Books, presents, &c.	70	0	0
Interest of 600 <i>l.</i> expended in			
School-room	30	0	0
	£. 192	0	0
400 Scholars, at 1½ <i>d.</i> per			
week for 48 weeks, or 6 <i>d.</i>			
each	120	0	0
	£. 72	0	0

An annual dinner is given to the children, when they are examined in public before their parents, and the rewards due to merit bestowed: the whole expense cannot exceed a hundred pounds per annum. Let me ask those to whom this sum is no particular object, whether the like sum could produce equal pleasure and satisfaction to the donor, or afford so fair a prospect of

increasing the happiness of individuals and society at large?

It would be contrary to all views I have taken of the subject, to make the contributions compulsory; that would destroy the independency of character I could wish to establish; the loss of which is one great and primary cause of many of the evils of the present system.

In seeking to make it a legislative measure, my object would be to obtain a power of granting aid from the parish rates to the funds of the societies. By making them general, it would put it in the power of any individual who contributed to a society, to remove to any other situation, and to transfer the value of his annuity into the funds of the society where he was settled. The effects of this would be to put an end in a very short period, to all the expense and trouble of litigation respecting settlements.

At some given period, (not to bear upon those at present advanced in life) it would be reasonable and just to treat such as become chargeable from neglecting or refusing to contribute towards their support, as "culpable poor." In proportion as the morals and sentiments of the labouring classes were improved and enlightened, so would the fear of disgrace operate as a punishment; and there would be, were the plan of benefit-societies generally established, a fair criterion to distinguish between the meritorious and culpable poor, which does not at present exist, and which thereby renders the existing laws on that head nugatory.

Attached

Attached to no particular scheme, and having but one object in view, the investigation of truth, I have endeavoured to convey my sentiments honestly, and with the warmest desire to promote the interest and prosperity of the country, founded on the facts which have occurred within my own experience. Others may have been led to opposite conclusions ; and the same credit of good intentions which I am willing to bestow, I desire to claim for myself. The state of the country is unparalleled, and the maxims of political economy which have prevailed in tranquil times, may now be found inadequate for the preservation of an isolated, but proudly independent nation. To a vast extension of our agriculture, and to the availing ourselves of all the bounties which a beneficent Providence places within our reach, I look forward with the most ardent wishes ; and may the advancement of true morality and virtue (those best supports of any government) go hand in hand with the patriotic endeavours of the enlightened and liberal promoters of their country's honour !

Workington Hall, Feb. 19, 1808.

THE END.



INDEX.

ACCOUNTS, 216, 248

Acland, Rev. T. 359

Addington, Mr. 146

Agricultural meetings, 258

Agriculture, great change in, within the last fifty years, 129

Antijacobin Review, 85

Apprentices, 218

Bailiffs, 233, 250

Barley, consumption of, in this country, 146

— culture of, 204, 223

Bates, Mr. 135, 138, 185

Bayle, Mr. 135

Beddoes, Dr. 89 note, 102

Bedford, Duke of, 15, 17, 184, 241

Beer inferior to milk as beverage for hard working people, 90

Bell, Mr. 363

Bliib's Survey of Husbandry surveyed, 201

Bolton, Mr. 354

Books on agriculture, 240

Bowyer, Mr. John, letter from, 97

Bréad, 86

Breakfast, comparison of milk with tea for, 85

Britain, only danger to, 103

— number of horses in, 142

— agricultural commerce of, 146

Britain, foreign trade of, 148

—— commercial population of, 149

—— agricultural population of, *ib.*

—— importance of agriculture to, 150

Butter, method of preventing a disagreeable taste in, 68, *note*

—— proportion of, to milk, 69, 93, 95

Cabbages as food for cattle, 41, 43, 44, 62

—— culture of, 211, 212, 270, 272

Calves, melasses or brown sugar not fit food for, 92, *note*

Campbell, Mr. D. 278

Carron company, 16

Carrots, a good substitute for oats, 11, 60, 175

—— substituted for potatoes, 29

—— profit of, 60, 176

—— their tops good for cows, 166

—— compared with oats, 177

—— method of keeping, 178, 266

—— preparation of the seed, 179

—— culture of, 262

Carts, single horse, preferable to waggons, 18, 251

Cato, 200

Cattle, sea-sand used as bedding for, 67

—— sale of, in Smithfield, 131

—— increase in size of, *ib.*

—— short-horned, 133, 135

—— long-horned, 133

—— kylo, 140, 186

—— on soiling, 161, 194

Children, easy and advantageous mode of providing clothing for, 327

—— illegitimate, 370

—— sent to manufactories, 370

China, 151, 231

Churns, 69, 70

Cleaning

Cleaning land, 210, 269

Clergy, 253

Clothes washed by steam, 13, note

— easy and advantageous mode of providing children with, 327

Clover, expenditure of $2\frac{1}{2}$ acres, 97

— dressings for, 108, 223

— used as green feed, 162

— mixture of rye-grass recommended with, 162

— management of, 191

Coal ashes, as manure, 54

Coke, Mr. 225

Coleman, Prof. his horse-shoe long used in India, 25

Coleseed, 41, 44, 64, 77

Collins, Mr. 136

Corn, necessity of bruising, 25

— farms, 61

— desirable to increase the quantity of, in this country, 105, 110

— for seed, should be of the best quality, 107

— bounties on importation of, 151

— public stores for, 152

Cottages, 239

Couch grass, 216

Cows, calving, 165

— milch, feed of, 39, 61, 65

— green winter feeding, 40

— their health not injured by keeping in the house, 42

— hints respecting their sheds, 43

— oil-cake good food for, 44

— expense of feeding, 47

— profit on, 49, 65—84, 92, 100

— affected by the state of the atmosphere, 66

— clover consumed by, 162, 163

Cows,

Cows, milch, consumption of water by, 163

Cropping, system of, 204

Dansie, R. S. esq. 15, 19

—— letter from, 23

Davy, Mr. 174

Des Cartes, 252

Dickinson, Dr. W. letter from, 99

Docks, 215, 216

Dodgson, Mr. John, 182

Draining, 207

Drill husbandry, 44, 47, 144, 214, 221, 268

Dundas, Lord, 102

Economy, 246

Education, 89, 363

Ellerton, Rev. E. 214

Evaporation from land, 273, 276, 281

Evelyn, Sir George Shuckburgh, 145

Experiments, 217

—— caution respecting, 4

Farmers, jealousy of, 232

Farming, general hints on, 197—259

—— by gentlemen, 197

Farms, period of entering on, 228

Faulder, Mr. 90, 251

Fences, 241

Ferns, Dr. Samuel, 38

Flanders, 150

Food, bulk requisite too, 10, 31

—— consumption of, by stock, 236

Friendly societies, 285

Gaff, Mr. Thomas, letter from, 96

Garget,

Garget, 165, 166

Gentlemen, farming by, 197

Gibson, C. esq.-235

Granaries, public, 152

Grasses, waste of different kinds in drying, 175

Grazing compared with soiling, 171

Green crops, tables of, 57, 58

—— great benefit from, 111

Green food for milch cows, 40

—— feeding stock on, 50, 51,

Grieve, John, esq. letter to, 16

Gypsum, 108, 114, 167, 222

Harrow hoe, 214

—— iron, 237

Hay compared with potatoes as food for horses, 6

—— as well as straw should be cut, 10

—— at 2*d.* per stone, no animal will pay the expense of feeding on, 40

—— compared with green crops as feed, 58

Horses, working, fed with steamed potatoes, 3—34

—— allowance of oats to, 11

—— carrots a substitute for oats, 11, 60, 263

—— estimates of the feed of, 11, 29, 32

—— their treatment in Hindostan, 25

—— fed on potatoes, should have but little water, 33

—— sea-sand used as bedding for, 67

—— number of, in England, 143

—— produce of land consumed by, *ib.*

—— expense of, in husbandry, 251

Hounds fed in part with potatoes, 4

Hurry, 206

Impatience, 205

Implements of husbandry, 258

Innclosure,

Inclosure acts, 127

Iron rail roads, 143

—— ploughs and harrows, 237

Irrigation, 253

Kent, Mr. 230

Kohlrabi, 41, 44, 64, 74

Labour, 217

Labourers, pay of, 179

Lancashire, a manufacturing county badly cultivated, 118

Lancaster, Mr. 363

Land, value of, 243

Landaff, vide *Watson*.

Landholders most affected by the high price of corn, 153

Leases, 224

Lime, 108

Local differences, 221

Lucerne, 165

M'Dougall, Mr. his pendulum churn, 70

Machines, 220

Malthus, Mr. 87, 113, 356

Manufactories, 115, 118, 154, 369

Manures, 221, 268, 269

Markets, attendance on, 244

Mason, Mr. C. 40, 186, 222

Method, 204

Milk, means of supplying the poor with, 37—157

—— quantity of, affected by the state of the atmosphere, 68

—— supplying the poor with, a great advantage to land-owners, 78

—— consumption of, in London, 80

—— ——— in various places, 81

—— increased supply of, increases the demand, 83

Milk,

Milk, happy effects of it as diet, 84

— an advantageous beverage for hardworking people, 90

— a supply of, diminishes the consumption of small beer, 94

— increased in bulk by the separation of the cream, 97

Miners society at Workington, 285, 300

Money, depreciation of, 145

Morals, growing corruption of, 295

Mowing grain a great advantage, 244

Oak, quantity required for a ship, 242

Oats, allowance of, to horses, 11

— carrots a good substitute for, 11, 60, 263

— best crop to follow potatoes, 107

— compared with carrots, 177

— culture of, 204, 223

Oil-cake, good food for cows, 44, 93

— expensive food, 50

— yields valuable manure, 51

— should be ground and boiled with chaff, 75

Ormandy, Mr. 183

Overman, Mr. 225

Oxen, their average consumption of hay, 9

— fed with potatoes, 34

Parkinson, Mr. 204, 222

Pastures, permanent, 215

Pitt, Mr. 117, 252

Plantations, 241

Plough, double coulter, 201

— iron, 237

Ploughing deep, 204, 208, 209, 237

— answers the purpose of rain to a crop, 212

— remarks on, 236, 273

Ponsonby,

Ponsonby, Miles, Esq. 272, 227

Poor, advantage to them of feeding horses with potatoes, 31

— on means of supplying them with milk, 37—157

— accounts of Workington, 287

— on the maintenance of the, 351

— education of the, 363

Porter, inferior to milk as a beverage for hard working people, 90

Potatoes, steamed, as a substitute for hay, to feed horses, 3—34

— advantage of mixing cut straw with them, 3

— hounds partly fed with them, 4

— water from them not injurious, 4, 28

— their advantages over hay, 6

— the haulm makes good litter, 8, *note*

— red bullock, answer well, 12, *note*

— do not answer as a substitute in horse feed for corn, 19

— process of steaming them, 26

— oxen fed with them, 33

— consumption of, in the north, 94

— prejudice against them in Flanders, 95

— great addition to arable land by their use, 105

— oats the best crop to succeed, 107

— as food for cattle, 138

— their tops eaten by cows, 166

— culture of, 211, 271, 278

Price, Dr. 359, 360

Priest, Rev. St. John, 18, 251

Pringle, Sir John, 140

Public-houses, 155

Publicity of proceedings, 243

Racks, a wasteful mode of feeding, 9

Rams, selling or letting at enormous prices, 233

Returns,

Returns, 246*Sand*, sea, used as bedding for cattle and horses, 67*Schistus*, applied as manure, 173, 222*Schoose farm*, 257

——— accounts, 193

——— farming society, 345

Seeds, 215*Servants*, 256*Sheds* for cattle, 43*Sheep*, 64, 114

——— sold in Smithfield, 131

——— increase in size of, *ib.*

——— fattening of, on grass land, 132, 133

——— Leicestershire, 133, 137

——— Scotch, 140

Sheffield, Lord, 117

——— letter o, 15

Sinclair, Sir John, 109*Smithfield*, table of sheep and cattle sold in, 131*Soaper's waste*, 108*Societies*, friendly, 285, 373

——— rules of, 300, 308, 314, 330, 341, 343, 345

Society, Workington agricultural, 257*Soiling* cattle, 161—194

——— profit of, 168

——— compared with grazing, 171

Somerville, Lord, 201*Sowing*, early, recommended, 223*Spain*, 149*Spedding*, John, Esq. 19

——— letter from, 21

Spring wheat, 109*Steam*, washing clothes by, 13, *note**Steaming* house and apparatus, cost of, 13*Stock*,

Stock, fed on green food, 50, 51

—— choice of, 254

Sugar, not good food for calves, 92, *note*

Survey of Husbandry surveyed, 201

Swinburne, Mr. W. 95, 162, 167

Taste, 237

Taylor, Dr. 38

—— Mr. G. 54

Threshing machines, 235

Time, saving of, 251

Tithes, 252

Turnips, as food for cattle, 41, 44

—— experiments on, 55-6-7

—— produce of, 63

—— as food for sheep, 134-5

—— culture of, 221

—— keeping, 266

Twitch-grass, 216

Walker, Dr. 132

Washing clothes by steam recommended, 13 *note*

Watson, Bishop, 242, 268, 271

—— his observations on steaming potatoes, 14

—— experiments on the waste of grasses in dry-

ing, 175

Weeding, 210

Western, Mr. 118

Wheat, for seed, should be of the best quality, 107

—— after clover, 108

—— spring, 109, 204


—— price of, at different periods, 122, 145

—— culture of, 204

—— should be mown, 244

Work, letting by bargain, 245.

Workington,

- Workington* Agricultural Society, 257
Workington, Miners Society, 285, 300
—— Friendly Society, 307
—— Sisterly Society, 313
—— Provisional Society, 324
—— Honourable Society of, 328
Workmen, 217, 245
Wotbershoon, W. Esq. letter from, 17
• *Wright*, Mr. John, 109
- *Yarker*, Mr. 226
• *Young*, A. Esq. 262, 276, 281
- 

ERRATA.

Page	Line	
15	12	for month read months.
53	3 fr. bot.	conduced read conducted.
58	5 f. b.	its read the.
62	15	were read was.
81	8 f. b.	3 10 read 8 10.
83	alt.	place read pace.
85	10	the only read only an.
108	10 f. b.	farrows read furrows.
133	13	37 st.
214	10	pursue read preserve.
163	6 f. b.	practicable read practical.
167	9 f. b.	put read fit.
228	9	Midsummer read michaelmas.
381	8	3d. read three.

REFERENCE TO THE ENGRAVINGS.

Plate, 1, *Potatoe Steamer.*

No.

- 1, 1, 1. Three of the wooden Steam Tubs with perforated bottoms, placed on the leaden steam vessels 0 0 0, which are each 12 inches diameter, and 9 inches deep.
- 2, 2. The Boiler, formed of two iron pans, screwed together by flanges, each pan is of the capacity of 40 gallons.
3. A cock which conveys the water by a pipe from the reservoir to nearly the bottom of the boiler.
4. A cock which lets in (or stops) the steam to the tubs.
5. A safety valve fixed on the top of the boiler, loaded with a weight equal to 4lb. to a square inch.
6. A cock fixed in the inside of the boiler, to ascertain when it contains a proper quantity of water.
7. One of the potatoe tubs detached from the stand. Height, 2 feet, 20 inches wide at top, and 17 at the bottom; holds 11 stone of potatoes. If the whole are not in use, the lead pipe of communication may be stopped. Each tub and cover is held down by four leavers, with iron bolts at the end of each leaver.

An Explanation of the part which goes by the Mill.

8. The wheel that connects with the Alabaster mill.
 9. The band wheel which turns the straw cutter.
 10. The crank at the end of the axle of the horizontal shaft, which carries the lever that works on centre 11, 11.
 12. The lever.
 13. The iron shank which disengages from the knife by a joint, so that the knife can be sharpened.
 15. The hopper which the carrots are put in, and stands behind the straw cutter.
- N. B. The straw cutter moves about 30 strokes per minute.
- U, U. Stone troughs for bruising and mixing the potatoes with cut straw.
- N, K. The two cranes which lift the tubs and washer.
- D. The washer in the act of emptying into the reservoir.
- L. The reservoir.
- Z. The pipe which furnishes water from the reservoir.

G. The